DISCARD

from M. L.
Christmas 1907

ENAMELLING.

BY THE SAME AUTHOR.

WINDOWS: A BOOK ABOUT STAINED AND PAINTED GLASS.

NATURE IN ORNAMENT.

ART IN NEEDLEWORK: A BOOK ABOUT EMBROIDERY.
Third Edition.

ALPHABETS OLD AND NEW.
Second Edition.

LETTERING IN ORNAMENT.

PATTERN DESIGN.

ORNAMENT AND ITS APPLICATION.

MOOT POINTS: FRIENDLY DISPUTES UPON ART AND INDUSTRY.
In conjunction with Walter Crane.

THE COURSE OF ART AND WORKMANSHIP

ENAMELLING

A COMPARATIVE ACCOUNT OF THE DEVELOPMENT AND PRACTICE OF THE ART

BY

LEWIS F. DAY

AUTHOR OF
'WINDOWS,' 'ART IN NEEDLEWORK,'
'NATURE IN ORNAMENT,' ETC., ETC.

WITH 115 ILLUSTRATIONS

LONDON
B. T. BATSFORD, 94 HIGH HOLBORN
1907

LIBRARY
WITHDRAWN
EASTERN OREGON STATE COLLEGE
From EOU Library
LA GRANDE, OR 97850

BRADBURY, AGNEW, & CO. LD., PRINTERS,
LONDON AND TONBRIDGE.

PREFACE.

THIS is not a book for the learned, but for artists, craftsmen, students, and lovers of enamelling. As to the history of the subject, I know enough to assume no personal authority upon dates and derivations. All I have set myself to do, so far as they are concerned, is to put into handy, readable, and easily intelligible shape the gist of what I have learnt from Kondakow, Von Falke, Franks, Labarte, and other learned but less helpful specialists. As to the practice of the art, I may claim a closer acquaintance with technique, with vitreous colour,* and especially with design, than belongs to the usual equipment of the scholar; and I have tried, not so much to map out with impossible precision the direct but in any case very problematical development of enamelling, as to find out precisely where we are, to take, as it were, stock of past accomplishment, with a view always to fresh enterprise in art and workmanship. None but a rather dense or a very self-satisfied devotee of modernity can help seeing the need of some such preliminary to original work.

* On the chemistry of the subject I have had the invaluable assistance of my friend Mr. William Burton, F.C.S., than whom there is no better authority.

What further it is possible to do, what new forms of beauty the near future may bring to birth, remains for each of us in his generation to show. But no man ever did a thing the worse for knowing how others did it before him. A new departure is best made from the point of view which gives a glance round at the ground already covered. The well-marked paths behind point to the less certain path before. A portion at least of the experience of others before him is the natural inheritance of every workman, and he is none the poorer when he comes into it. Some knowledge of what is outside his own experience goes to the expression of an artist's very self.

We live in days when comparative study is made easier than ever it used to be. Time, after separating out for us the good work of the past, has drifted it into museums. There we can not only see it as we could scarcely do in the church treasuries where much of it was long piously preserved from view, but have the opportunity of comparing the best with the best, each piece with others of its kind. A serious student has only to apply to the museum authorities, and they will allow him, of their courtesy, to examine whatever he is interested in as closely as need be.

The very scope, however, of the great museums is a source of confusion and perplexity to the student. They contain so much—some of historical, some of artistic, some of purely technical interest! How is a beginner to know what to look at, and what to look for in it?

I have tried to write a book which shall smooth his way to understanding, to point out what has been

done, to say when and where it was done, and as far as possible to explain how it was done and why it was done so.

The reader must not expect to learn in these chapters how to do it. To that there must go also something only to be acquired in the workshop. Besides, I am not an enameller. What I offer him is an introduction to the master-workmen who have given enamel the value it has in our eyes, and a passport to the enjoyment and the intelligent use of the museums in which it is stored up.

CONTENTS.

		PAGE
I.	What Enamel is	1

HISTORY AND SURMISE: WHAT WE KNOW OR THINK WE KNOW.

II.	Ancient Enamel	6
III.	Roman, Celtic, and Barbarian Enamel	16
IV.	Byzantine Enamel	28
V.	Gothic Enamel	37
VI.	Barbarian Enamel	49

JEWELLER'S ENAMEL, TECHNICALLY AND ARTISTICALLY CONSIDERED.

VII.	Encloisoned Stones and Glass, and Imitation Jewels	55
VIII.	Cloisonné	61
IX.	Champlevé	67
X.	Champlevé and Cloisonné	82
XI.	Repoussé	91
XII.	Basse Taille	101
XIII.	Wire Enamel (Unpolished)	108
XIV.	Painted Cloisonné	122
XV.	"Plique à Jour"	129
XVI.	Incrusted Enamel	133
XVII.	Blended Colours	140
XVIII.	Enamel "En Résille"	147

PAINTER'S ENAMEL, HISTORICALLY AND ARTISTICALLY CONSIDERED.

		PAGE
XIX.	Painting in Translucent Colours	151
XX.	Venetian Enamel	161
XXI.	Painting in Grisaille	167
XXII.	Tinted Grisaille	177
XXIII.	Painting in "On-Enamel" Colour	185

ENAMEL COLOUR, HISTORICALLY AND CHEMICALLY CONSIDERED.

XXIV.	The Palette of the Enameller	193
XXV.	Changes in the Palette	201
XXVI.	The Metal and the Palette	210

DESCRIPTIVE LIST OF ILLUSTRATIONS.

B. M. = *British Museum.* V. & A. M. = *Victoria and Albert Museum.*

PAGE

1. Goldsmiths' Work, Cloisonné, and inlaid with lapis, sardonyx, etc., cemented into the cells. Pectoral of Rameses II., found at Serapium. Louvre - - - - - - - - - - - 7
2. Wooden Figure, Champlevé, evidently to be inlaid with stones, glass, or something which could not in any case have been fused into the wooden matrix. Egyptian. Kunst Historisches Museum, Vienna - 9
   Note.—A similar figure in the Louvre has inlay of lapis, turquoise, carnelian, etc., still embedded in it.
3. Fragment of Coloured Earthenware, Champlevé, and inlaid. Square tesseræ of hard vitrified paste have been pressed into the plastic clay. Found at Tel-el-Yahoudieh. K. H. M., Vienna - - - 11
   Note.—There are similar fragments in the B. M. and at the Louvre.
4. Engraved Soapstone, glazed with turquoise enamel and inlaid with vitreous or other hard coloured pastes. Egyptian. B. M. - - - - - - 12
5. Portion of a Gold Necklace, with touches of pale blue and green enamel in the petals of the flowers, etc. Found at Kertch. Greek. From "Les Bijoux," by Eugène Fontenay - - - - - 13
6. Red Enamel or Glass, into which a bronze swastica-shaped ornament has been embedded. It is one of a series of studs ornamenting a Celtic shield found in the Thames at Battersea. B. M. - - - - 16
7. Bronze Ornaments, Champlevé, found at Polden

PAGE

Hill and Norton, in Suffolk. Colours opaque yellow and red, the red in a state of decay. Possibly first or second century A.D. - - - 17

8. Bronze Disc, Champlevé, the enamel colour green and red (blended). Celtic. A.D. 450—600. V. & A. M. - - - - - - - - - - 18

9. Bronze Flask, Champlevé. Blue, orange, yellow, and red enamel, the red almost perished. Perhaps fourth century A.D. Found at Pinguente (Istria). K. H. M., Vienna - - - - - - - - - 19

10. Bronze, Champlevé. Red (vertical lines), dark red (black with white specks), pale greenish, decayed (white paper), yellow (horizontal lines). The dotted white represents grey-green bronze. Romanesque. V. & A. M. - - - - - - - - - - 20

11. Silver Fibula, Champlevé. Colours: lemon, dark green, lapis blue. Late Roman. K. H. M., Vienna - 21

Note.—There is a precisely similar design in red, orange, and green, at the V. & A. M.

12. Bronze Fibula, Champleve. Red and blue enamel in outer border are scarcely distinguishable. The divisions of the inner border are alternately red (very much decayed) and checquers of blue and white. These may be either enamel or sections of fused-glass rods. Gallo-Roman or Merovingian. Bibliothèque Nationale, Paris - - - - - 22

13. Bronze Ornament, Champlevé, with inlays of glass fused together: A, grey-blue and white tesseræ on red; B, blue with slight tessera-shaped depressions; C, white flower, with red ring round the eye, on blue of middle tint; D, in the lower half, blue flowers with white eye ringed with red, on white ground; in the upper half, blue pattern on a white ground. Romano-British or Gallo-Roman. V. & A. M. - - - - - - - - - - 23

Note.—The very same patterns occur in another stud in the museum at Rouen.

14. Bronze Ornament, Cloisonné. Lattice pattern lapis blue and white; checquer pattern pale

PAGE

yellow-green, and dark green. Lines and six-cornered panels in decayed red and lemon yellow. Irish, seventh or eighth century. Formerly at the college of St. Columba, Rathfarnham, now in the Dublin Museum - - - - - - - - - 25

15. Bronze Ring, Cloisonné. The panels marked A are filled with millefiori glass, as shown in the enlargement within the ring. In the glass itself you can see the drag of the pattern, which often occurs in the drawing out of glass rods to reduce the design to a minute scale. The panels marked B and the stiles marked C contain a soft, yellow-brown, mudlike composition, which may have been either enamel or some substitute for it. Gallo-Roman or Romano-British. V. & A. M. - - - - - 26

16. Silver Fibula, with inlaid, riveted plaques of punched gold foil. Merovingian. Germanic Museum, Nuremberg - - - - - - - - - 27

Note.—Very similar, but more ornate, fibulæ in the museum at Arras have filigree ornament and upstanding jewels set in them.

17. The "Iron Crown of Lombardy," Cloisonné. Opaque blue and white on a translucent green ground; some red also, which looks as if it might be "restoration." A votive Lombardic or Byzantine crown, probably of the ninth century. Now in the cathedral at Monza - - - - - - - - 29

18. Book-cover. The cross and medallions are in cloisonné enamel. Translucent violet, dark blue and red, and white, on a translucent emerald green ground. The border is of inlaid stones or glass, green, garnet red and dark blue, apparently the work of goldsmiths not themselves enamellers. Byzantine. *Circa* seventh century. In the library of the Doge's Palace, Venice - - - - - - 30

19. Silver-gilt Reliquary, Cloisonné. Various colours, some of them opaque, on a translucent emerald green ground. Byzantine. Tenth century Pierpont Morgan collection - - - - - 31

PAGE

20. Velvet Bag, sewn over with plaques of silver-gilt, in which are mounted heart-shaped and other green and garnet-red jewels or imitation jewels. Pearls and gold and silver cord make up the rest of the pattern. Germanic Museum, Nuremberg - - 33

21. Cap or "Crown" of Constance of Sicily, on to which are sewn cloisonné enamel plaques and jewels. Light and dark blue, green, and sealing-wax red. Twelfth century. Palermo - - - - - 34

22. Enamelled Book-cover, Cloisonné. Translucent blue and green, opaque lemon yellow and white, grey-blue neither quite translucent nor quite opaque. German-Byzantine. V. & A. M. - - 35

23. Semicircular Plaque, Champlevé. Busts of the Virtues in medallions. Ground to scrollwork lapis blue. Medallions white, yellow, green, and dark red. Rhenish. Twelfth century - - - 37

24. Foot of an Altar Cross, Champlevé. Lapis (black), green (dark dotted), yellow (lines), very pale blue or white (dotted), on a gilt metal ground. German. Godfrey de Claire, Huy on the Maas. *Circa* 1165. V. & A. M. - - - - - - - 38

25. Panel of the "Alton Towers," Triptych, Champlevé. Dark blue, green, red, turquoise, and light grey-blue. German, from the workshop of Godfrey de Claire, Huy on the Maas. Middle of twelfth century. V. & A. M. - - - - - 39

26. Enamelled Book-cover, Champlevé. Three shades of lapis, turquoise, green, yellow, white, and dark red. The figure of Christ and the heads of the other figures are cast and applied. Limoges. Thirteenth century - - - - - - - - 41

27. Copper-gilt Pyx, Champlevé. Dark red, lapis blue, and turquoise. The ground of the shields and the pattern between them is "reserved" in the metal and gilt. Limoges. Thirteenth century - 42

28. Plaque from the Base of a Cross, Champlevé. Lapis, light blue, turquoise, green, dark red, and white, on copper gilt. Limoges. Early thirteenth century. 43

PAGE

49. Enamelled Plaque, partly champlevé, partly cloisonné. Italian. Eleventh century. B. M. - - 44

50. Copper-gilt Reliquary, Champlevé. Figures reserved and chased, heads applied. Ground of upper subject grey-blue, of lower one deep lapis, with cross bands of green. Limoges. Thirteenth century - - - - - - - - - - - 45

51. Bronze Effigy of Archbishop Maurice, with plaques of champlevé enamel on the mitre, stole, cushion, etc. The figure is in wood overlaid with sheets of bronze once gilt. Enamel colours, white, turquoise, cobalt, and points of sealing-wax red. The flesh is painted in colour which is not vitreous. The robe is diapered with engraving. After 1238. Burgos Cathedral - - - - 47

52. Pierced Chalice-holder. Gold or silver-gilt wire with translucent green and purple and opaque green enamel, on which colours are dots of white enamel. Russian. Seventeenth century. N. M., Buda-Pesth - - - - - - - - - 51

53. Portion of a Fretted Plaque, cloisonné enamel, copper gilt. Chinese. V. & A. M. - - - - 53

54. Cloisonné Jewellery. Gold, inlaid with red and green glass. Ostrogothic. Ravenna Museum - 55

Note.—There is a very similar jewel at the Cluny.

55. Copper-gilt Crucifix, Champlevé Enamel, jewelled. French. Thirteenth century. Pierpont Morgan collection - - - - - - - - - - 57

56. Bronze Disc, Champlevé. Apparently blue enamel in the form of little glass tesseræ. About full size. Found at Lisieux. Now in the museum at Rouen - - - - - - - - - - 59

57. Gold Plaque, with figure of archangel Michael, cloisonné. Byzantine. Typical thirteenth century work. The colour, as it were, "shot" with gold. Kloster Dshumati Ghurian. From Kondakow - 63

58. Landscape Panel, Cloisonné. The cloisons used not only to enclose colour, but to give drawing upon it. Sea and clouds all white. Colours, blue,

PAGE

green, turquoise, lemon yellow, and a sort of yellowish drab; pale tints blended. Chinese. Latter part of eighteenth century. V. & A. M. - 64

39. Crucifix, Bronze, about 10 in. high. Champlevé. Cross, green with bronze ornament; border line and "I.H.S.," dark blue; flesh, pink; hair and loin cloth, darkish blue; lips and cross on nimbus, red. Germanic Museum, Nuremberg - - - - - 69

Note.—In the British Museum there is a twelfth century Limoges crucifix which reminds one of this; but the head is flesh colour and the body white; this looks as if the enamel had changed colour, *i.e.*, as if the head had gone darker.

40. Copper "Gemellion," Champlevé. Figures, etc., reserved in the metal. Limoges. Thirteenth century. Cluny Museum - - - - - - 70

41. Front of a Casket, Champlevé. Figures chased, heads applied. Colours blended. Limoges. Thirteenth century. Limoges Museum - - - 71

42. Part of an Altar Front, Champlevé, measuring about 7 ft. 6 in. by 2 ft. 3 in. Cobalt, turquoise, chrome green, yellow green, with a little white and coral red. On gilt bronze, engraved. The heads are raised, the columns, etc., repoussé and pierced. At the base were jewels and plaques of enamel set like them: the illustration shows only the wooden substructure where the plaque should be. Twelfth century. Burgos Museum - - - - - 73

43. Copper-gilt Casket, Champlevé. The subject is "reserved" in the metal; the background is cobalt blue; the tessellated border is in red and blue, with blank squares, shown white in the drawing, not enamelled. Limoges. Second half of eleventh century. V. & A. M. - - - - - - - 74

44. Vestment Clasp, or Morse, Champlevé. Copper. Figures reserved and engraved, the lines filled in with enamel. Red, light green, and black. Limoges. Early fourteenth century - - - - - - - 75

45. Detail of a Reliquary, Champlevé. Figures and

PAGE

scroll reserved, on an enamelled ground. Shaded colour in the rather Persian-looking floral terminals. Limoges. Church of Bellac - - - - - - 76

. "The Lyte Jewel," enclosing a miniature of James I. The front is set with diamonds connected by scroll ornament incrusted, like the fillet, etc., with enamel in white and translucent colour. The back is in white enamel with fine lines of gold, enclosing little stiff-shaped patches of translucent ruby. The border is in imitation of rubies and sapphires. Given by James I. to Thomas Lyte (died 1638). Waddesdon collection, B. M. - - - - - - - - - 77

. Helmet, so-called "Cold Enamel," Champlevé. The strapwork is in black, vermilion, and gilt metal, this last enriched with an etched pattern. Etching has been used also in the background, which shows a gilt pattern on white. The slightly sunk coloured straps are edged with a raised line of silver. Borders and cresting entirely of gilt metal with etched pattern. Part of a suit of armour in the K. H. M., Vienna - - - - - - - - - - - 80

5. Detail of Cloisonné Design. Part of a large scalloped dish. Typical colours: turquoise ground with ornament in lapis and a little yellow and red. About full size. Chinese. Ming period, say 1450. V. & A. M. - - - - - - - - - - 83

9. Detail of Byzantine Cloisonné, slightly enlarged, from the book-cover shown in illustration No. 22 - 85

0. Cloisonné Vase, with appliqué enrichment. Copper gilt. Usual colours on a turquoise ground. Old Chinese. Wan Li period, 1573–1619. V. & A. M. 87

Note.—Compare figures in relief upon Limoges enamel Nos. 26, 35.

1. Brass Stirrup, Champlevé and Cloisonné. Opaque white, turquoise, green, yellow, and red, on a practically black ground. The broad lines are champlevé, the fine ones cloisonné. Hispano-Moresque. Fifteenth century. Pierpont Morgan collection - 89

2. Silver Plaques, with patterns beaten down and filled

PAGE

in, but not filled up, with enamel; the diaper with blue, varying from pale to deep; the scroll with green, blue, and red. From a Byzantine book-cover of the eleventh century in the Treasury of St. Mark's, Venice - - - - - - - - - - - 91

53. The "Demetrius" Tablet. Repoussé gold, with enamelled "jewels" of lapis blue, green, and white. The flesh has been incrusted with shell-pink, of which only a small piece remains on the neck, although the gold has been tooled over to give tooth to it. Thirteenth century. From the Welfen Schatz in the Gewerbs Museum, Vienna - - - - - 93

54. Repoussé and Chased Box. Gilt metal. Sunk ground enamelled with dark, semi-opaque blue. Chinese. From the Summer Palace at Pekin. V. & A. M. - - - - - - - - - - 95

55. Detail of No. 54 - - - - - - - - - - 95

56. Embossed and Cloisonné Vase. Colours in the petals of the flowers blended: blue to white; red to white or green; green to blue, yellow, or another shade of green. The eyes of flowers of a contrasting colour. Enamel not ground down flat. Chinese. Late eighteenth century. V. & A. M. - - - 97

57. Cast Brass Candlestick, Champlevé. Black, white, and green enamel, rather casually introduced into the background. English. Seventeenth century - - - - - - - - - - 99

58. Enamelled Gold Ornament. Neither champlevé nor cloisonné. The pattern seems to have been cut out of a flat sheet of metal and soldered on, so as to produce, together with the enclosing framework of wire, shallow cells for the colour. It forms part of the eleventh century reliquary of Pepin of Aquitaine in the church of Conques, but may very well be much earlier than that - - 100

59. Bowl of a Silver-gilt Chalice, Champlevé. Inscription in silver on translucent blue ground. Main design reserved on a translucent green ground, with touches of red and blue in the trefoils. On it are the

PAGE

arms of Don Pedro Nunez de Lara, Count of Majorca in 1381. Hispano-Flemish. Louvre - - - 102

50. Jewelled Knife Handle. Silver-gilt top with rubies. Pale opaque blue leaf-shapes with gold markings upon them, gilt flowers on dark translucent green ground, to which the chasing underneath gives sparkle. Indian. Pierpont Morgan collection - 103

51. Gold Miniature Case, with translucent champlevé enamel. German. Probably Augsburg work. Seventeenth century. Pierpont Morgan collection - 105

52. Silver Casket. Pattern-work in cloisonné enamel (the cells not filled up) with pierced ground showing the gilt metal with which it is backed. Translucent cobalt, green, turquoise, and yellow; opaque green, Naples yellow, and black. German. Seventeenth century. V. & A. M. - - - - - - - 109

Note.—See No. 70 for enlarged detail.

53. Disc of Cloisonné Enamel. The cells formed by the cloisons have been only once filled with enamel. This shows, in fact, only the first stage in the process of enamelling. But, as it is on the under-side of the vessel, it may not have been meant, in this case, to be carried further. Old Japanese. From Bowes - 110

54. Detail of Wire Enamel. Part of a book-cover. Opaque turquoise, green, Naples yellow, and black, on white ground. There are spots of white on the black. Russian. Seventeenth century. V. & A. M. - 111

55. Silver Tankard, with pierced ground. Enamel not flush with the cloisons. Translucent green and opaque white, the latter traced with red. National Museum, Buda-Pesth - - - - - - - 112

56. Silver Case, with pattern of twisted wire, the ground filled in with white and opaque-coloured enamel. Russian. V. & A. M. - - - - - - - 113

57. Enlarged Detail of No. 66 - - - - - 114

58. Detail of the foot of a silver-gilt chalice, the outline of the design in wire, twisted and plain. The tendrils are in coils of wire standing up in round relief. Leaves and grapes are in translucent copper

PAGE

green on a manganese purple ground. Hungarian. Sixteenth century. Pierpont Morgan collection - 115

69. Parts of a Chain. Pierced cloisonné on silver over plates of silver-gilt. Translucent green, opaque turquoise, and (in the flowers) white traced with red 117

70. Enlarged Detail of No. 62, showing small leaves, not enamelled, and discs of metal at the junctions of the wire, all of which strengthen the network of enamel - 119

71. Filigree Ornament in silver wire on gilt. Manganese, pale blue, and coral-coloured dots. The eyes of the flowers are jewelled. N. M., Buda-Pesth - - 120

72. Silver-gilt Buckle. Open cloisonné in silver wire, mounted on a gilt ground, leafage in translucent blue and green and opaque turquoise, flowers in opaque white traced over with red or blue and shaded with yellow. Buda-Pesth - - - - 122

73. Part of a Parure in Silver Filigree. Wire enamel, with painting in colour on the white enamelled flowers. Hungarian - - - - 123

74. Part of a Silver Clasp. Wire enamel, painted. Gewerbs Museum, Buda-Pesth - - - - 124

75. Details of Jewellery, the white enamel painted with black or red. N. M., Buda-Pesth - - - 125

Note.—Compare with No. 82.

76. Portions of a Copper-gilt Pipe. In the larger detail dotted parts stand for the metal, white for white enamel, horizontal lines for opaque turquoise. The white flowers are traced with blue and red. The metal outlines to these, as well as the stems and leaves, are got by chasing. Persian. Nineteenth century. V. & A. M. - - - - - 127

77. Silver-gilt Goblet, with decoration in "plique à jour" enamel. The body of the cup is delicately engraved with pattern-work not shown in the drawing. Burgundian. Probably early fifteenth century. V. & A. M. - - - - - - 130

78. Detail of No. 77. "Plique à jour." Pale green (dotted), amber yellow (lines), sapphire blue (cross hatching), and crystal clear enamel - - - - 131

PAGE

9. Jewelled Ornament for the Hair. Incrusted enamel. White flower with rubies inset, translucent green leaves. Hungarian. N. M., Buda-Pesth - - - - - - - - - - - 133

0. Enlarged Detail of silver-gilt pendent frame. Flowers incrusted alternately with opaque white and translucent ruby; no enamel on the leaves, etc. Fifteenth century. Pierpont Morgan collection - 134

1. Filigree Chain. Flat links silver, raised links gilt. Flowers, etc., encrusted with opaque yellow, pale blue, white and translucent green and manganese. N. M., Buda-Pesth - - - - - - - - - 135

2. Details of Enamelled Jewellery. N. M., Buda-Pesth - - - - - - - - - 137

Note.—Compare with No. 68.

3. Silver Vase. The ornament in relief and partially encrusted with translucent and white enamel, the white shaded with glaze colour. Japanese. Nineteenth century - - - - - - - - - 138

4. Enamelled Grave Plate of Geoffrey Plantagenet Champlevé. It measures about 2 ft. by 1 foot, and is said to be the largest as well as the earliest known piece of Limoges work. In the illustration the relation of the colours has been disturbed by photography. The lapis blue ground of the shield should show darkest of all, and darker than the "reserved" lions upon it; next in intensity should come the green drapery, then the grey blue on the heraldic lining of the cloak, and lightest of all should be the paler grey under-garment. The flesh is of a pale, blurred, purplish tint, the eyes white with blue pupils. In the background diaper the trellis is blue-green; the fleurs-de-lis are alternately blue and white upon a "reserved" ground; the bands, etc., with engraved cross-hatching, are also "reserved" metal. After 1151. Now in the museum at Le Mans - - - - - - - - - - - 141

5. Part of a Casket, copper gilt, with arms of England, Angoulême, Valence, Earl of Pembroke, and Dreux,

PAGE

Duke of Brittany and Brabant. Red, blue, white, and black. The red of the dark lion is speckled with blue. Limoges. Late thirteenth century. V. & A. M. - - - - - - - - - 143

86. Plaque with Shaded Colour, Champlevé. German (Godfrey de Claire). Twelfth century. B. M. - 145

87. Enamel on Glass Paste ("Émail en résille"). In the style of Etienne de Laune. French. Sixteenth century. B. M. - - - - - - - - - 147

88. Enlarged Detail of No. 87. White, mauve, deep red, green, and blue. Gold outline. French. Sixteenth century. B. M. - - - - - - - - - 149

89. Detail of the Entombment, from the Centre Panel of a Triptych. Painted enamel, in translucent colours and gold, by Nardon Penicaud. *Circa* 1500. Pierpont Morgan collection - - 155

90. Plaque painted in translucent enamels, after Etienne de Laune. Limoges. Sixteenth century - - 157

91. Oval Mirror Frame. Venus and Cupid. Painted in translucent colour, partly over foil, and heightened with gold. Flesh opaque white. The rock and figures against it are in embossed relief. Landscape translucent green, sky pale blue, flowers ruby and sapphire over foil. Jean de Cour or Courteys. Second half of sixteenth century. Pierpont Morgan collection - - - - - - 159

92. Circular Dish enamelled in translucent colours and opaque white, with pattern on the enamel painted in gold, enclosing little jewels of opaque turquoise and coral red. Venetian. Fifteenth or sixteenth century 161

93. Beaker enamelled in translucent colours and opaque white. The drawing upon the white enamel is black, "poinctillé." Crescents, stars, etc., of gold foil are pressed into the translucent colour. "Burgundian." Fifteenth century. K. H. M., Vienna - - - 162

94. Silver-gilt Beaker in grisaille and gold on a black ground. Flemish. Fifteenth century. Pierpont Morgan collection - - - - - - - - 163

Note.—The foot is modern.

PAGE

95. Silver-gilt Spoon enamelled in purple white and green, with leaves, etc., in foil, cut to shape, modelled, and embedded in the enamel. German. Fifteenth century. V. & A. M. - - - - - - - 164
96. Detail of No. 95 - - - - - - - - - 165
97. Salt-cellar. The history of Hercules. Painted in grisaille with touches of gold. Pierre Reymond. Limoges. Sixteenth century - - - - - 167
98. Enamelled Medallion. Portrait of Andrea Doria, the outlines evidently scratched through the white down to the black enamel ground. Blue beard, yellowish brown drapery, brown cap dotted with gold, gilt lettering, etc. Limoges. Sixteenth century. V. & A. M. - - - - - - - 169
99. Grisaille. Tinted flesh, some gold. Pierre Courteys. Limoges. Sixteenth century - - - - - 170
100. Ewer in Grisaille, glazed in parts with blue, green, and violet, and touched with gold. Conty Nouailher. Limoges - - - - - - - 171
101. "Neptune riding the Waves." Large plaque chiefly in blues, with warm red in the flesh, and some gold. The painter seems to have painted white over blue, and to have glazed that again with blue. In the chariot the ground colour of the metal shows through a transparent yellowish flux. Leonard Limousin, after Marc Antonio. Waddesdon collection, B. M. - - - - - - - - - 173
102. Part of a Candlestick painted in grisaille. Limoges. Seventeenth century. V. & A. M. - 175
103. Cupid and Psyche. Small plaque; figures painted first in white, and upon that with pale colours for the modelling: cobalt blue, turquoise, manganese purple, brown, grey, and lemon yellow. The curtain is glazed with translucent green. Leonard Limousin, after Raffaelle. *Circa* 1540. V. & A. M. - - - 177
104. Plaque. Figures painted in grisaille on dark blue ground and tinted with greenish turquoise. Landscape and foliage are in translucent green. Jean Penicaud II. (figures taken from Marc Antonio and

PAGE

Raffaelle). Limoges. 1500 to 1550. Salting collection - - - - - - - - - - - - 179

105. François I. as S. Simon. Plaque of large size, painted with extraordinary directness. Ground white; drapery modelled in colours; under-drapery almost entirely in gold on brown; flesh a pinkish, liquid-looking glaze over delicate grisaille. One of a series of the twelve Apostles, from the Château d'Anet, by Leonard Limousin, signed and dated 1547. Now in the church of S. Pierre at Chartres - 181

106. Painted Enamel. The cupid in grisaille on a ground of translucent green. Border sapphire blue, with shells painted in white and glazed with translucent colour (turquoise and manganese purple), into which again are painted touches of white. Scrollwork in gold. Italian? Fitz Henry collection - - - 182

107. Portrait of Jacques Gallot de Genouilhac. Ground deep blue, flesh warm red, velvet coat and cap black. Leonard Limousin. *Circa* 1540. V. & A. M. - - - - - - - - - - 183

108. Canton Enamel. Brass saucer, coated with white and painted after the style of the "famille rose" porcelain. Flowers rose and blue, leaves green, border blue and white, band on the inside of border yellow. Chinese. *Circa* 1700. V. & A. M. - - - 189

109. Canton Enamel. Copper saucer, coated with white and painted after the style of lacquer work. Design in dark brown with tracing in gold upon it. Chinese. Nineteenth century. V. & A. M. - - - - - 191

110. Enamelled Pipe-holder. Copper, coated with a deep rich blue, upon which are little raised blots of enamel in imitation of coral and turquoises. The grey tint represents gilding on the enamel. Modern Persian. V. & A. M. - - - - - - - 201

111. Gold Chain, Champlevé, enamelled black and white. N. M., Buda-Pesth - - - - - - 202

112. Bronze Plaque in the form of an Altar. Dark blue and green fairly well preserved, sealing-wax red much decomposed, and (in the empty

PAGE

cavities) a pale greenish colour which may be remains of turquoise or other enamel. Romano-British. Early Christian era. Found in the Thames. B. M. - - - - - - - - - - - 204

113. Onyx Vessel (the lower half of it serves also as a separate basin) set in jewelled and enamelled goldsmith's work. In the two broad bands rubies and emeralds are framed in white strapwork and gold filigree on black. In the handle, knob, etc. (where there are no jewels), opaque turquoise, pale cobalt and yellow, as well as translucent green and blue, are used. French or Italian. Sixteenth century. K. H. M., Vienna - - - - - - - - 208

114. Silver Butterfly Ornament, Cloisonné, in opaque yellow, red, and white, together with turquoise, cobalt blue and green, which are relatively translucent. Chinese. V. & A. M. - 212

I. WHAT ENAMEL IS.

INTRODUCTORY.

Popularly speaking, any hard, glassy outer coating is enamel. We speak of the enamel of the teeth, and in so doing can hardly be said to use language loosely. In the commercial sense, a paint which gives a smooth and glossy surface—it may be to the wall of a room, it may be to a complexion the reverse of smooth—goes by the name of enamel. Technically, enamel is a coating of colour fused on to glass, pottery, metal, or whatever mineral substance will stand heat enough to fuse it. The colour upon glass or glazed earthenware is also, no doubt, in the strictest sense, "enamel," because it is vitreous, and burnt on; and the phrase "enamel colour" is expressly employed to indicate colour that is not *in* the glaze or *under* the glaze, but annealed to its surface. There is, logically, no reason why a piece of enamelled glass or porcelain should not be called an enamel; but, as it happens, enamel with what used to be called the "indefinite article" before it, has come to be used in a limited sense. *An* enamel is now generally understood to mean enamel upon metal.

That is the subject here under discussion—vitreous colour fused to gold, silver, copper, brass, iron, or whatever the metal may be. Enamel is really glass upon metal. It is not merely glassy colour, but coloured glass; and that is why there is nothing to compare with it for gorgeousness except stained glass,

glass mosaic, and, of course, jewellery—in deliberate imitation of which coloured glass was first made.

The antecedent use of glass in place of jewels would of itself be enough to account for the use of vitreous colour in connection with goldsmith's work. That was illuminated at first with precious stones, then with imitations of them in glass, and eventually with enamel. Apart, however, from forgery or imitative intention of any kind, enamel is the metal-worker's way of getting brilliant and varied colour. Damascening, inlaying and incrustation gave him the colour of various metals, gold, silver, copper, brass, tin and so forth; but beyond that he was dependent upon enamel, which was still in so far metallic that the colour in it was due to a metallic oxide, and congenial, therefore, to what it enriched.

Enamel is inseparable from glass-working. In it the glass-worker comes to the help of the goldsmith, and gives him colour beyond the range of the available metals, and more easily manageable than the inlay of precious stones, which it is wasteful as well as troublesome to cut to shape.

It would be difficult to draw a hard-and-fast line between glass and enamel. As soon as ever the metal-worker found that melted glass would adhere to metal, the art of enamelling, or, if not precisely that, the way to it, was discovered. It is only one remove from glass-working to enamelling, and, as we shall see, some of the earliest enamels may quite possibly have been the doing simply of glass-workers. Later we find that enamellers were often, if not actually engaged in glass-painting, the sons or fathers of glass-painters.

The birth of enamel is, and must always be, obscure. Who will be so rash as to say that any nation adept at once in metal-work and in the making of glass may

not, as a matter of fact, have gone the short step further and produced enamel? All we can take for granted is that, had they done so to any considerable extent, some record or remains of their work would in all likelihood have come down to us.

Enamel colour consists practically of coloured glass, powdered, mixed up into what is called a "paste," and, when it is dry, melted on to the metal. The term "paste" seems to have an attraction for writers on enamel. Perhaps it is the false air of learning about it which is so alluring; but their constant use of it has done something to obscure the simple fact that enamel is only glass. What if it is made up into a paste? All glass in the viscid, dough-like state in which it is plastic might quite as well be described as paste.

Powdered glass naturally spreads as it melts. Accordingly the jeweller built up little walls of wire to confine it, or beat down troughs for it if it was thin gold he was using. When, later, he worked in thick bronze, he dug them out of the solid.

All early enamelling being metal-worker's colour, it is only natural that metal—gold, silver, or gilt bronze—should play a part in its design, whether as background, as pattern upon a coloured ground, or as outline between the colours. Nothing is more characteristic of early enamel than the boundary of gold between the colours; and it has a wonderful effect in harmonising tints in themselves bright to the verge of crudity. It is just possible that we have here the source of that systematic separation of colour from colour by intervening gold, which was the secret of the very successful dealing with rather dangerous primaries so characteristic of Moresque colour decoration.

Early enamel is not only goldsmith's colour, it is characteristic of the goldsmith's craft, and could only

have been done by an adept in it. Enamellers began with small pieces of jewellery, and confined their enamel at first to minute portions of these. So long as they used the blowpipe to fuse it they could not do otherwise. With the use of a furnace of some kind, their facilities increased; but it was not until the art had made great progress that they could fire vessels of any considerable size, as the Chinese did—although, according to Dr. Bushell, their enamel "was fired in the open courtyard, protected only by a primitive cover of iron network, the charcoal fire being regulated by a number of men standing round with large fans in their hands." They would not have been able to do what they did except by the use of a much softer medium than that of the Byzantine or Gothic enamellers. The fusibility of the enamel is always a very important consideration, determining not only the number of colours that can be fused at one fire, but the size of the pieces it is possible to produce. Only a highly developed craftsmanship will account for very large pieces of enamel free from serious flaws, even though the enamel may be comparatively soft.

It would be possible to divide enamels arbitrarily into classes: according to the quality of the enamel, translucent or opaque; according to the method of workmanship adopted in turn by gold or silversmith, bronze-worker and painter; according to the place and period of its execution. But it would be hopeless to discuss any one such class without reference to the others. On the whole, the simplest and most profitable proceeding is to follow, as far as possible, the course of evolution: that will lead us by the way to the consideration of the various kinds of enamel, the methods of workmanship employed, and the when and whereabouts of their employment—each of which

subjects can afterwards be taken separately into consideration.

Enamelling is properly one of the decorative arts. It is seen at its best in association with jeweller's, goldsmith's and coppersmith's work. Like every other art, it took eventually a pictorial direction; but the first pictures in enamel (basse taille) were still goldsmith's pictures—engraved or chased in gold, the variation in each colour got, not by painting, but by deeper or shallower sinkings, according to which the translucent colour was made to show darker or lighter at the goldsmith's will. When enamellers learnt how to keep their colour "still" without banks or beds to hold it, they did without metal boundaries and relied altogether upon painting.

From the thirteenth century down to our own time enamel-painters have cherished their art as something apart and independent. And very beautiful things have been done in it, from the jewel-rich triptychs of Nardon Penicaud, to the finished portraits of Leonard Limousin, and the exquisite miniatures of Petitot—none of which we could well spare. Nevertheless, it was not the medium in which a painter could most effectually express himself. The enamel-painters of the Renaissance sacrificed to the unattainable the best that was to be got out of enamel. Its possibilities were all in the direction of colour; and they took to grisaille! In asserting the independence of their art, they called attention to its shortcomings.

II. ANCIENT ENAMEL.

EGYPTIAN AND GREEK.

THE concern of all concerned in art is mainly with what enamellers did and how they did it. But it is impossible to discuss even that without reference to where and when it was done. Progress in technique was naturally along the lines of civilization. The course of art was very much the course of events; and some preliminary survey of the field of historic development is indispensable to right understanding of design and workmanship.

Traces of enamel are to be found in times remote and in places wide apart. The footprints of the first explorers in the field of enamelling have, however, been trodden over. It is no longer possible to identify them. The enameller has been there sure enough; but there seems no knowing precisely who he was, whence he came, or where he learnt his trade. We know that here and there enamel has been found; we may have good grounds for supposing that it was made on the spot; we may be all but sure it was not made after such or such a period in the world's history; but how much earlier than that probable date something in the nature of enamel may have been practised here or there, how it came to be done at all, and where it originated—these, for all our science of research and thoroughness of exploration, are questions still, if ever, to be cleared up.

That does not prevent our forming very definite

I. EGYPTIAN CLOISONNÉ—NOT ENAMEL.

notions as to the course of craftsmanship. Indeed, every independent investigator seems to form a theory of his own ; and, since no two theories agree, anyone looking at the subject in the light rather of craftsmanship than of learning is thrown back upon his own discrimination. He has to choose between absolutely contradictory statements made with equal authority. All he can pretend to do is to trace the probable course of events ; and that is all it is here proposed to do.

It is to be doubted whether the ancient Egyptians got much beyond the threshold of enamelling on metal. Few authorities claim more than that for them. All that is clear is that they used colour which, if not enamel, would have been, if they had known how to get it. The

vitreous filling of their cloisonné jewellery is inlaid glass, which may or may not have been fused into its cells. You can see quite plainly how, for example, the gradation of colour from red to lapis blue and from lapis to turquoise in the cresting of the pectoral of Ramses II. (page 7) is got by piecing together little bits of glass or stone: the dividing line between two "pastes" of enamel would be nothing like so sharp as that. Again, where a background is filled in with blue, you can detect the joints between the pieces of inlay. In the famous hawk and in the well-known bracelets in the British Museum quantities of greyish cement remain in the cells where the inlay has fallen out, and what remains does not quite fit the cells. This argues that it was not fused in, and not enamel therefore.

The examples quoted by those who will have it that the Egyptians did enamel are of comparatively late date, belonging to the Egypto-Roman period. There is to be found, no doubt, in Egyptian jewellery of about the beginning of the Christian era, remains of light blue colour, which certainly fills the cavities—champlevé in this case—in a way which inlays of glass or stone do not. (It is significant that blue and white were the colours with which the Greeks incrusted their jewellery.) If we assume that to be enamel, light blue of a more or less turquoise tint would seem to have been for a long while the only enamel the Egyptians had: at all events they used inlay for other colours. This light blue is now in a whitish stage of decomposition. There are other colours, in a powdery condition, still clinging to the cells of Egyptian goldsmith's work; but there is nothing to show that they were anything more than coloured cement. It is quite certain that the colour in the little wooden figure opposite (none of which remains to tell its story) was not enamel. Vestiges of

2. EGYPTIAN CHAMPLEVÉ—WOOD.

colour in ancient work are no proof of enamelling. It would have to be proved that the colour was vitreous and had been fused into its place.

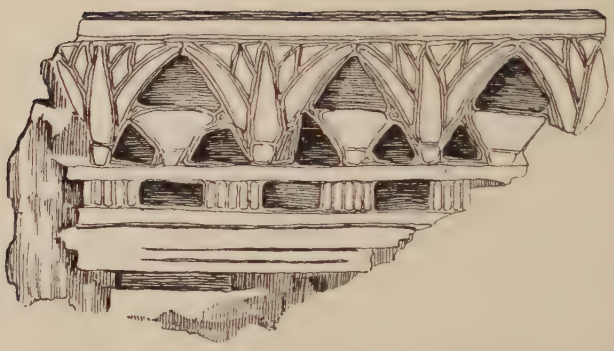
Why, it has been asked, considering the skill of the ancient Egyptians in glass-making and glass-working, should we not give them the benefit of the doubt, and admit that the wonder would have been if they had not discovered enamelling? It certainly is strange they did not. But the persistent use of inlay can hardly have been a matter of preference on their part. It is difficult to imagine them continuing, when once they had enamel, to use it only in cases where it was impossible to insert lapis or whatever they may have used. The conclusion is that they had at the best a colour or two, not a palette of enamels, and for the rest were dependent upon inlay, whether of stones or glass.

Curiously enough, in pottery also the Egyptians inlaid little bits of glass which they fused to the clay. That is quite plainly seen in the figures from Tel-el-Yehudiyeh in the museum at Vienna (opposite). There are similar fragments of about the same date, *ca.* 1300 B.C., in the Louvre and in the British Museum, and in quite a number of pectoral ornaments in the British Museum (dating from about 1000 to 300 B.C.), where the cubes of glass, similar to those in the fragment overleaf (4), are so sharply defined, and the clay has so unmistakably shrunk away from them in the fire, that it is certain they must have been inlaid in the condition of hard slabs and not of a paste or powder of glass. In other cases a fracture shows here and there a thin slice of glass projecting beyond the thick layer of cement on which it is embedded—cement for which there would have been no occasion if enamel had been used.

There is a fragment of soapstone in the British

3. EGYPTIAN CHAMPLEVÉ—CLAY.

Museum (4) decorated with little rectangular cubes of red and dark blue glass cemented into the trenches dug out for the purpose, whilst the surface of the pectoral itself is thinly glazed with turquoise blue, this last properly fused in the fire, and showing darker in the engraved lines upon the face of it which mark the



4. SOAPSTONE GLAZED WITH VITREOUS ENAMEL AND INLAID.

petals of the lotus flowers. This use of enamel in connection with inlay seems clearly to indicate just how far they could go at that date. According to Kondakow this light blue enamel is to be found also upon goldsmith's work. A reddish colour in the sunk parts of chased goldsmith's work as ancient perhaps as the time of Ramses III. (1200 B.C.) seems to have been got by a wash of some metallic substance. Something of the kind is still done in Indo-China and the Far East. It is certainly not vitreous, and consequently not enamel.

We have only to assume that "electron" means enamel and the antiquity of the art is carried back at once to the siege of Troy: Homer is its witness. But the word may stand either for enamel or for amber, or for the mixture of gold and silver (an alloy found naturally in Siberia and elsewhere), which enamellers early found it convenient to use. That use may account for the confusion of enamel with the metal on which it was done, just as the similarity of amber to translucent enamel explains how it is that the description of the one answers for the other. When literature speaks with

such an uncertain voice it is safer to rely only upon what remains to us of classic art—and that is not of very great importance.

There are in all the great museums examples of delicate goldsmith's work dating from perhaps the fourth century B.C. (about the finest period), in which the petals of wee flowers, rosettes and other small details (as in the necklace below), are thinly coated with white or pale blue, within a slightly raised outline of delicate gold wire (cloisonné). All authorities are agreed to accept this as vitreous. It was apparently a very soft enamel, fused with the blowpipe, at such a low temperature that it is by this time mostly in a state of powdery decay.

The use of colour in this way appears to have been only occasional. Goldsmiths seem, so far, only to have been experimenting. The very way in which they introduced it, always in minute quantities, marks their limitations. Enamelling did not yet amount to an art in itself. All we can say is that jewellers had succeeded in getting some very few vitreous colours to adhere in small quantities to gold.

There are, however, in the British Museum, two or

5. GREEK GOLDSMITH'S WORK WITH TOUCHES OF ENAMEL.

three rings, ascribed to the tenth century B.C., which are of an altogether more substantial character, and very different from the thin incrustation of six centuries later. One of these looks more like a thick cord of blue glass (there is a sort of twist in it) than like enamel, and might fairly be described as a glass ring mounted in gold—glass rings were common objects in those days. Or the glass-blower might have come to the aid of the jeweller, and wound round the ring this twisted cord of molten glass. It would only be a short step from that to another ring of the Mycenean period which is more of the ordinary champlevé type.

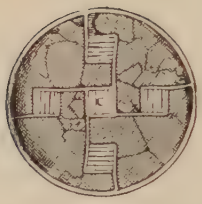
The third ring shows again a band of vitreous blue framed in gold; but there is embedded in the blue a pattern in filigree—a key pattern in gold wire—executed in the same way as lettering is sometimes done in Byzantine cloisonné enamel. Still it is not quite certain that we have in this a proof of that high development of the art which seems to be indicated. Here, again, it is just possible that the glass-blower may have had a hand in it. Why should he not have spun a stout thread of molten glass round the ring, pressing it well into the interstices of the fret, so that, when it was ground down, the pattern showed in gold upon a blue ground? Or the goldsmith might (after a fashion still practised in the East) have embedded bent gold wire in the red-hot glass and so produced his pattern.

It is perfectly plain that the glass-blower did work with the goldsmith. There are in the British Museum some little pendant cocks and swans on Etruscan earrings, found at Chuisi and elsewhere, which it is impossible to mistake for anything but glass. The glass-blower has, as it were, modelled the bird in opaque white glass on an "armature" (as a sculptor would call it) of gold wire—much in the way that in

other instances he has made beads in the form of a mask—white glass for the face, blue for the hair, and for the eyes other little round beads stuck into the larger irregularly shaped ones.

The credit to the Greek artificer is the same, no matter how the work was done; but it seems strange that, if enamelling had in the tenth century B.C. already reached the point of pattern in cloisonné, it went no further, and there is so little to show for it.

In the natural course of events one method of work has always been superseded by a better or more convenient one. It is in the highest degree improbable that, before the days of modern research, a technique, highly developed but extinct, should have been discovered again. But that is what is supposed by some to have happened in the case of enamelling. Nowadays, of course, we discover all sorts of secrets, some of which were never lost.



6. CELTIC BRONZE STUD, WITH VITREOUS COLOUR.

III. BARBARIAN ENAMEL.

(CELTIC, GALLO-ROMAN, ETC.)

ALL sorts of suppositions have been hazarded as to the origin of enamel in Western Europe, and as to its dissemination. It has even been suggested that it was the work of the gipsies or of some sort of travelling tinkers who wandered about the world with their kilns. There is no need to dwell upon such speculations.

With regard to barbaric work generally the question is: How much of it is enamel, as we understand it? The little hemispherical bosses of colour in the gold cup which forms part of the S. Miklos treasure, at Vienna, are plainly nothing more than little half beads of parti-coloured glass, which may have been imported from anywhere. (The theory that it was ever enamelled all over is untenable.)

The earliest Celtic or Gaulish enamel, so-called, consists admittedly of studs or buttons of red in deliberate imitation of coral, and may be at least as properly called glass as anything else. It was not until after the Roman occupation that blue and white were used.

The red buttons on the shield found in the Thames and now in the British Museum, which is supposed to belong to about the beginning of the Christian era, are

not, as might be gathered from the diagram given opposite (6), cloisonné enamel. The ring of metal and the swastika within it form together a single piece of fretted metal, and this appears to have been impressed into molten glass. The button itself was attached to the shield by a central pin or rivet passing through it and the bronze plate of the shield.

Archæologists claim to have discovered at Mont Beuvray, the ancient Bibracte, not only enamel, but the very kiln of the enameller. There is nothing in the find preserved in the museum at St. Germain to prove to the unbiassed mind the practice of enamelling in that place before the Christian era. There are some crucibles, some rings and beads of glass, and some cakes of presumably vitreous colour, which may just as well have been the raw material of the glass-worker as of the enameller. A bronze vase with a scroll pattern grounded-out and filled with what looks like greenish drab or mud-coloured enamel is described as of "provenance inconnue," and so proves nothing. Other vessels in bronze have pattern work hollowed out as it might be for enamel; but as similar

7. CELTIC BRONZE CHAMPLEVÉ.

E. C

objects are inlaid with silver, the shallow grounding-out may very likely have been for that. What jewellery there is at St. Germain is decorated, not with enamel, but with encloisoned glass.

From the time of the Roman occupation of Britain, corresponding to the end of the La Tene period, we find without any doubt vitreous colour fused to bronze

8. CELTIC BRONZE CHAMPLEVÉ.

—the ornament, that is to say, scooped out and filled in with enamel. Here, again, I cannot myself help suspecting that the glass-worker may have anticipated the enameller; and the often-quoted passage from Philostratus about the barbarians by the sea who poured their colour on to the red-hot bronze points (no matter whether they were Gauls or Britons) to the fact of the glass-worker coming to the help of the metal-worker and dropping on to the bronze dabs of molten glass which, when they came to be ground

down, left in the cavities a pattern in coloured glass. That would account for much that is otherwise difficult to understand; for, wherever there were skilled workers in both glass and metal, it was within likelihood they should sometimes work together.

There seems to be nothing to prevent the execution of such work as that shown on page 17 by the glass-blower and metal-worker between them. And as for the brooch opposite, the blend of red and green is

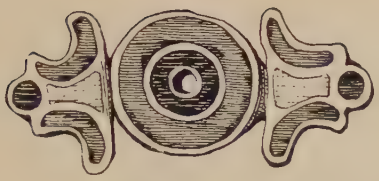
9. LATE ROMAN BRONZE CHAMPLEVÉ, FROM PINGUENTE.

C 2

just what the glass-worker could easily get. To the enameller it would not be so easy. It may, of course, be only the oxidisation of age.

However it may have been done, we get about the beginning of our era champlevé enamel. The little bronze altar-shaped ornament in the British Museum (112) is presumed, on the strength of its not being finished, to have been made in Britain, where it was found. An altogether much more accomplished piece of work is the flask discovered at Pinguente (9), belonging, perhaps, to the middle of the third century, a singularly effective piece of straightforward champlevé. Of the three colours in it, lapis blue, orange, and sealing wax red, the red is almost entirely decayed. Riegl suggests that this last was never meant to come to the surface of the metal, and was hacked over to give hold to a subsequent coat of colour, of which there is no trace. As a matter of fact, the broken surface is just what continually occurs where bad enamel splits up in the

10. ROMANESQUE CHAMPLEVÉ IN BRONZE.



11. LATE ROMAN CHAMPLEVÉ IN SILVER.

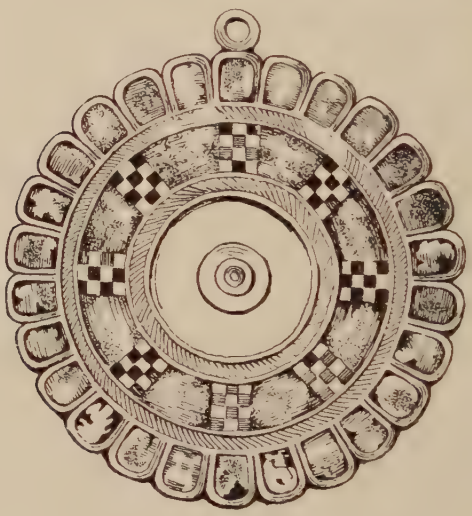
process of decomposition. It is the red, by the way, in the Roman altar which has crumbled away. The pattern of the so-called Celtic example from the Victoria and Albert Museum, opposite (10), suggests, by the foliation in the circles, more a Byzantine origin. The work is in some respects not unlike that in the Pinguente bottle.

In the first four centuries A.D. there was a good deal of more or less barbaric jewellery, Frankish, Gaulish, or by whatever name it is to be called, decorated with opaque enamel, very often in rectangular divisions plainly reminiscent of inlay. The brooch from Vienna, above (11), is in silver, but there are others of precisely the same pattern in bronze (which was much more commonly used) at the Cluny and at the Victoria and Albert Museums, described in the one case as Gallo-Roman and the other as Romano-British. Whether these were made in the countries where they were found or whether they were imported, it would be rash to say. The clumsier work may be set down as most likely home-made; but the type is in any case Roman.

In some of the Gallo-Roman and other champlevé jewellery the cruciform design of which fixes a date within the Christian era (perhaps the fourth or fifth century) there is a coarse pattern in the colour itself, such as white dots on a blue ground. This is so obviously not designed to fit the space as to suggest the idea of an inlay of patterned glass.

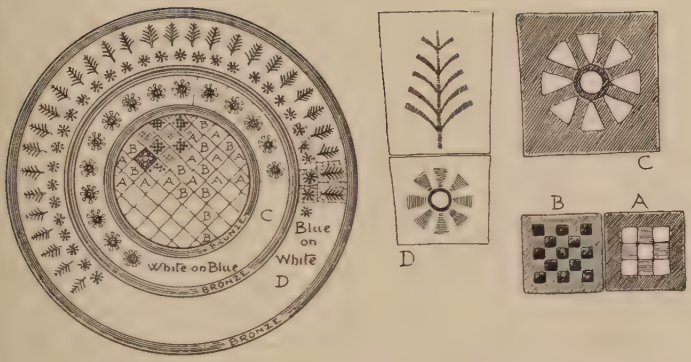
LIBRARY
EASTERN OREGON STATE COLLEGE
LA GRANDE, ORE. 97850

The Gallo-Roman, or, as it is sometimes called, Merovingian, brooch in the Bibliothèque Nationale at Paris (12) has been made by Viollet le Duc and others the text of considerable discussion. The question is how the enamelling of the blue and white checquers which alternate with the cubes of red in the inner ring was done, there being no metal between the colours.



12. GALLO-ROMAN CHAMPLEVE IN BRONZE.

It has been suggested that red enamel was first laid in, this cut away in parts and filled in with white, and this again partly dug out and filled in with blue. But why, in that case, did the designer go out of his way to adopt a geometric form of design so difficult to execute in enamel? A much more likely solution is that he put together mosaic-wise cubes alternately of red glass and of tessellated blue and white (cross-slices of blue and white glass rods melted together in the familiar Roman way)



13. GALLO-ROMAN SO-CALLED ENAMEL.

and fused them into their place. The fact that the little checquered pieces are rectangular and do not radiate to fit their position is in favour of this supposition.

We find, it is true, in Rhenish and Limoges work of the eleventh to the thirteenth centuries spots and lines evidently got by digging or scraping out some of the moist paste of one colour and filling up with another; but in that case the outline is always blurred. The sharper outline, too precise to have been done in that way, might have been got by engraving the pattern in the enamel after it was fired, filling it up, and firing it again: but even that process will not account for the much finer work of a similar kind, commonly described as enamel, which is unmistakably "millefiori" glass inlaid and fused. It is difficult to imagine any other way in which work so minute could be executed.

The centre diaper in the brooch, above (13), is unmistakably fused Roman glass mosaic. In the larger checquer, A, there is no mistaking how the sections of the grey and white rods enclosed in red go to make the pattern. In the smaller, B, all we can

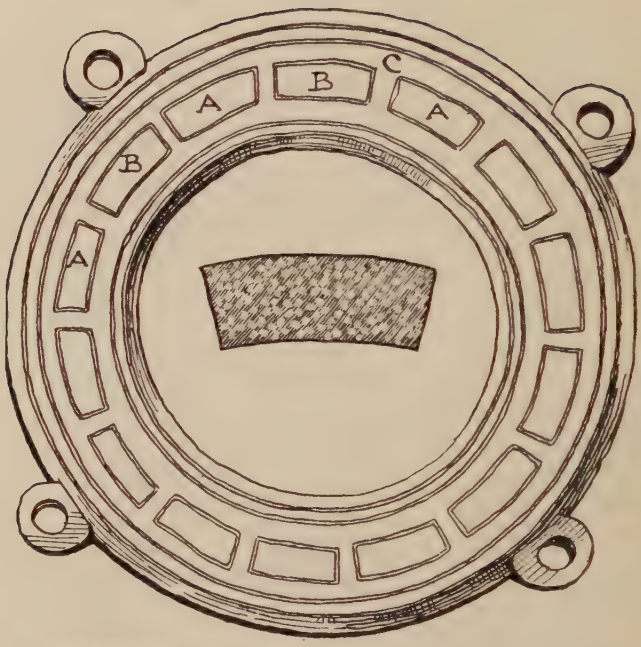
now see is little square depressions in the blue (clogged up with dust), due no doubt to the decay of the softer glass which went to make a more minute checquer pattern produced in the same way. Sections of alternate compound rods of glass of the two patterns, fused together, give the diaper AB. The band of white flowers on a blue ground (C) is similarly made up of little sections of "millefiori" patterned glass. The outer border (D), which shows a blue pattern on a ground of white "crackle," is at first sight rather puzzling; but on examination one detects a stronger line of dark crackle, which really shows how the pattern was put together, though a multiplicity of other cracks in the glass confuse the lines of evidence, so that it is difficult at first to trace them. On close inspection they leave no room for doubt. It is worth mentioning that there is in the museum at Rouen a brooch found in a Frankish cemetery at Creil, near Eu, in which precisely the same patterns of glass are used, though not in quite the same order.

There is in the Victoria and Albert Museum a specimen of Celtic enamel, so called, in which wee sharply cut flowers are left upstanding in a bed of devitrified powdery substance, only to be accounted for as remains of partly decayed millefiori glass. The flowers are too sharp to have been worked in the soft enamel, and it is hardly likely that little bits of hard glass should have been pressed into enamel paste and fused together with it. If already-fired enamel had been engraved with a diaper of flowers and filled in with other enamel, this last would naturally have been softer than the ground, and the flowers would have perished first, whereas in millefiori glass the flowers would naturally be of harder substance than that in which they were enwrapped. This seems to me conclusive.

14. IRISH BRONZE CLOISONNÉ.

It will be remembered that in old Egyptian glass in which the zigzag or other decoration was produced by threads of different-coloured material, fused and welded into a compact mass, it is no uncommon thing to find certain of the waves represented only by sunk lines where the streaks of a particular colour have perished. There is only one explanation of this: that the glass fused together was of different consistency, and that some of the colours have gone before the rest.

The remarkable translucent pattern-work in ancient Irish jewellery, such as the heart-shaped ornament (14)



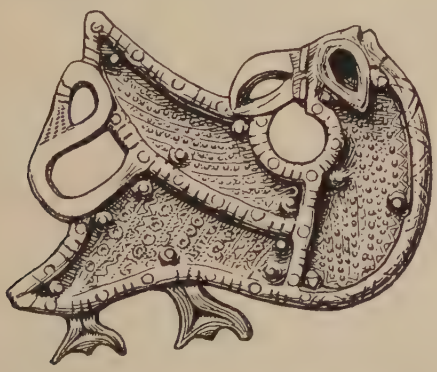
15. GALLO-ROMAN OR ROMANO-BRITISH BRONZE, MILLEFIORI GLASS AND ENAMEL?

now in the Dublin Museum, has more the appearance of glass-work than of enamel; and in the Romano-British or Græco-Roman fibula in the Victoria and Albert Museum, above (15), the plaques (A and B) are beginning to separate into little more or less square divisions corresponding to the fragments of millefiori glass of which they were composed. This putting together of pieces also goes to explain the usual incoherence of minute pattern-work of this sort, otherwise so puzzling, in Celtic and other early jewellery. In this particular fibula the translucency of the ground colour reveals that particular drag in the design so frequently seen in millefiori glass,

resulting as it must from the process of drawing-out by which the patterns were reduced from manageable dimensions to the tiny scale which is one of the remarkable things about them.

Glass-work of the minute kind here described indicates a proficiency in glass-working far beyond that to which we have any reason to suppose Frankish workmen had attained. The goldsmith who riveted down little plates of punched gold into a framework of silver, below (16), had clearly much to learn in his craft besides enamelling; but any bronze-worker would be quite capable of using up precious pieces of patterned glass which came in his way, if not of fusing them together.

Had this millefiori pattern-work really been enamelling, it would have indicated a development of the art nowhere else to be found in the seventh or eighth century, though by that time, of course, Byzantine cloisonné enamel was well established.



16. MEROVINGIAN FIBULA IN SILVER, WITH ONLAY OF GOLD FOIL.

IV. BYZANTINE ENAMEL.

The oldest Byzantine enamel is to be traced no further back than the sixth century, when Persia and Byzantium were in close contact. From the latter part of the ninth to the eleventh century it flourished exceedingly; and work of that period is comparatively abundant. It is all in gold, usually cloisonné, mostly translucent; and, if we go by what remains to us and not by what we are told, it was made until the eighth century only in small pieces. In the Iron Crown at Monza (opposite), which may possibly be of the ninth century, it is only the corner pieces between the big seven-petalled flowers or rosettes which are enamelled; and they seem to have been separately done. It looks as if little pans of enamel had been inserted, four of them in each of the rectangular parts of which the crown is made up. Kondakow considers this to be Lombardic work; Bock calls it Byzantine; but for artistic purposes we may consider Lombardic as Byzantine, and so we may Sicilian.

In the eleventh century the Abbot of Monte Cassino brought over Byzantine workmen to Italy. Before that there were workshops at Palermo; and the Sicilian work done for the caliphs was very much like the Byzantine, except that it was a little more Saracenic-looking. Technically perhaps it was not quite so good, but it was hardly less beautiful than the best, and it is extremely interesting in design.

17. THE IRON CROWN OF LOMBARDY, CLOISONNÉ.

The heyday of Byzantine enamelling was in the tenth and eleventh centuries, and there is not much of any great importance before that, though the Paliotto at Milan dates from A.D. 835. No part of the famous Pala d'Oro is earlier than A.D. 976, and the Crown of St. Stephen belongs at the earliest to the end of the eleventh century. The Sicilian work in the Treasury at Vienna is chiefly of the twelfth century.

The kind of cloisonné enamel on gold included under the general title of Byzantine seems not to have spread much further. Something of the kind may have been done in Britain and Ireland in the eighth and ninth centuries; but the finding of a fibula here and there is no proof that it was made on the spot, and the enamels mounted in Anglo-Saxon or early British goldsmiths' work are not necessarily the work of British enamellers. Antiquaries have a way of ascribing all

18. CLOISONNÉ ENAMEL AND ENCLOISONED GLASS.

they possibly can to their own country. The Hamilton brooch, for example, is claimed by some as Anglo-Saxon, notwithstanding that it has all the character of Byzantine work.

The Eastern origin of cloisonné enamel seems to be

written on the face of it. It is surmised by Kondakow that it developed itself in Persia and spread from the frontiers of the Sassanian Empire to Transcaspian territories, the Northern Caucasus, Egypt, Asia Minor, South Russia, and along the Don and the Danube. Others say it is Turanian. In any case all this is

19. BYZANTINE CLOISONNÉ ENAMEL, TRANSLUCENT.

conjectural. We have no ancient Persian enamel in proof of a Persian source, though we may trace, or think we trace, Persian influence in Early Byzantine work. We do not even know precisely at what date enamelling was first practised in the city of Constantine; probably it was in the time of Justinian, in the middle of the sixth century. Such cloisonné of the fifth century as may have come from there is supposed to have been brought with them by artificers driven so far west by the force of historic events, and not done on the spot.

Byzantine enamel was made at first in very small pieces, often not more than an inch or an inch and a half square or in diameter, such as we see in the book cover in the Treasury at St. Mark's (page 30) which is supposed to be of the seventh century, and the oldest binding of the kind existing. We have no evidence that they had the means of making larger pieces than the plaques, round, square, cruciform, or whatever their shape might be, which the metal-worker used, in conjunction with precious stones *en cabochon*, to decorate large and important pieces of gold and silversmiths' work. It was some time before they could make a plaque the size of that shown on page 31, and then they had to eke it out with separate border strips to make a fair-sized reliquary. The shrine work in larger works was built up of separate pieces in the form of arcading, pilasters, and other architectural features. The smaller plaques, framed in filigree or repoussé work, associated perhaps with encloisoned jewels, were sometimes used in a rather arbitrary way. The fact is, they were not as a rule designed for the special purpose to which they were put. It was a common thing for devout believer or repentant sinner to sacrifice to the Church objects of personal trinketry; and these were in due course

20. JEWELLED METAL PLAQUES SEWN ON TO STUFF.

worked into the decoration of some Gospel cover, portable altar, or other piece of ecclesiastical furniture, where the difference between the finish of their execution and the crudity of the local silversmiths' work is very striking. But, apart from this, the more one sees of early Byzantine enamel the more impossible

21. THE CROWN OF CONSTANTIA II., CLOISONNÉ ENAMEL OF THE TWELFTH CENTURY, PALERMO.

it is to doubt that these little jewels of enamel were from the first made for no more special purpose than to be set wherever they would give point and colour to the design of goldsmith's work. It was at once the

22. BYZANTINE CLOISONNÉ, PARTLY TRANSLUCENT.

practical thing to make enamel in these little pieces and the artistic thing to use them as jewels. And the making of such little plaques for export became a flourishing Byzantine industry. Another common use of them was in the decoration of stuffs. They were sewn, together with gems and seed pearls, on to royal and ecclesiastical vestments, where they added greatly to the somewhat Oriental magnificence of the embroidery. In the Imperial Treasury of Vienna there

are numerous instances of this kind of thing on sword, scabbard, gloves, and imperial mantle, derived, it is not surprising to find, from Sicily.

An interesting combination of jewellery and silversmith's work with textile material is shown in the little bag (page 33) preserved in the Germanic Museum at Nuremberg. This is of much later date, and, as it happens, there is no enamel in it; but it shows to perfection the decorative use of little plaques of metal in connection with woven fabrics, to this day quite common in the East. A similar use of enamel is shown in the cusping round the precious stones, and in the little spandrils between the quatrefoils, on the crown of Constantia (page 34), designed this time apparently for the place they occupy on the cap which is the basis of the crown. The more important enamelled plaques which go to make the crown of Constantine Monomachus at Buda-Pesth show more plainly still how the cap is really the origin of the crown, though the goldsmith's work, originally added to it by way of decoration, eventually reduced it to comparative insignificance.

We think of Byzantine cloisonné as translucent. It was not always so. In the very early work in the Pala d'Oro it is opaque, and in the book cover in the Victoria and Albert Museum (page 35) translucent and opaque colours are both used. And then there is a very charming variety of thirteenth century work (examples of it are to be found at the Bibliothèque Nationale, the Louvre, the Cluny, the Bargello, and other museums) in which a delicate scrollwork of gold wire, on a ground of translucent green or blue, breaks out into leaves and flowers in opaque red, yellow, blue, green, and white enamel.

23. TWELFTH CENTURY CHAMPLEVE, RHENISH.

V. GOTHIC ENAMEL.

The Byzantine root of mediæval enamel, champlevé or cloisonné, needs no historic confirmation. The evidence of our eyes is enough. The character of early Western work is unmistakably Byzantine (23, 24).

The theory, which even French archæologists no longer very valiantly combat, is that enamelling was introduced into Europe by Theophano, a Byzantine princess who, when she married Otho II., brought with her enamellers from the East. That she took some interest in craftsmanship may be assumed from the favour in which she held St. Bernwald, whose name is associated with the remarkable bronze-founding done at Hildesheim. He was her trusted adviser and the tutor of her sons. The imported artificers worked naturally in gold, as their practice was, and it is not until the twelfth century that we find the art of enamelling on copper well established in Germany. Theophano lived at Trèves, and was so much at home

at Cologne that she chose to be buried there. It was chiefly at Trèves and Cologne, Huy (24, 25), Maestricht, and Verdun, that enamel was practised—towns close enough together to suggest that these various workshops were not separate growths, but most likely suckers from one parent root planted by Theophano. The occurrence of enamelling at Tegernsee, on the south eastern outskirts of Germany, may be explained by a seed dropped there on the way from the East. What wind blew other seed so far west as Limoges (26) who shall say? It may have been borne from the Meuse to Paris and thence southward to Bourges, Limoges, and Toulouse, and in a more westerly direction to Chartres, Le Mans, and Angers; or it may have spread from Limoges upwards to Angers and Le Mans, to Bourges and Chartres, and so reached Paris from the south.

We have no knowledge of enamel having been done in France before the second half of the twelfth century, and we do know that in 1145 Suger, Abbot of St. Denis, sent for enamellers to that very province of Germany

24. EARLY GERMAN CHAMPLEVÉ ENAMEL.

25. TWELFTH CENTURY CHAMPLEVÉ ENAMEL EXECUTED AT HUY BY GODFREY DE CLAIRE.

where it was undoubtedly practised. There would have been no occasion to do that had there been capable artists nearer home. That, by the way, would point to Paris, the nearest point to the Meuse, as the nursery of the art in France. There is significance also in the story that later still, in the year 1181, some French monks from Grandmont in the Limousin went to the Rhine and brought back with them Rhenish enamels. It is to the year 1189 that the earliest known products of Limoges are ascribed. The theory of Limoges enamel having been derived from Venice would be more credible if we had evidence of enamel having been practised there at the time, which there does not seem to be.

It is not because it was the starting point of the art, still less because of any superiority of the work done there, that Limoges is identified in most men's minds with the kind of enamel practised in the Middle Ages, but, on the contrary, because of the enormous quantity of work, good, indifferent, and downright bad, turned out there in the thirteenth century, when the art had become a trade conducted on the scale of wholesale manufacture.

The already-mentioned Byzantine art established at Monte Cassino developed in rather later Gothic times into champlevé on silver. The Italians do not seem to have taken so kindly to bronze.

In England we have not much to boast of. There is the tomb of William de Valence at Westminster; but, as Sir Woollaston Franks points out, he belonged to a family which had possessions in the Limousin; and the inference that the enamels for his tomb were brought over from there is obvious. The very interesting altar decoration from the Abbey now in the Jerusalem Chamber is decorated with plaques of

26. THIRTEENTH CENTURY CHAMPLEVÉ, LIMOGES.

27. THIRTEENTH CENTURY CHAMPLEVÉ, LIMOGES.

imitation cloisonné, painted on the under-side of glass, which does not point to a flourishing condition of enamelling in this country at the beginning even of the second Gothic period. If the genuine thing had been readily obtainable a rich Church would not have been likely to put up with its cheap substitute.

The "provenance" of any particular piece of work is never so sure as even internal evidence would seem to show. There was such constant intercourse between centres of industry, more particularly between the monasteries even of countries far apart, that the influence of one school upon another goes without saying. Was there ever a time when competitors did not promptly follow up the successes of their rivals? It is certain that even what we call characteristics of one school were copied by others, with a view to cutting into its trade. Mediæval champlevé, German as well as French, is very often loosely described as Limoges.

All things considered, a term like "Limoges" is best used with discretion; and, bearing in mind that the town became eventually famous for work of a very different kind, it would seem to be the better plan to reserve it as far as possible for the *painted* enamel brought to such perfection there.

When we think of it, there is no reason why enamel should not have been made wherever they made stained glass. The strips of bronze between enamel colours correspond precisely to the strips of lead

between the pieces of glass which go to make an Early Gothic window; and they constantly remind one of them. There is, for example, a twelfth century casket in the Gewerbs Museum at Vienna in which the severity of the lines makes you think at once of stained glass.

The likelihood seems to be that champlevé is the direct outcome of Byzantine cloisonné. This new departure in the direction of champlevé (27, 28) is but the workmanlike solution of the problem set by the goldsmith to the bronze-worker. It was no such easy

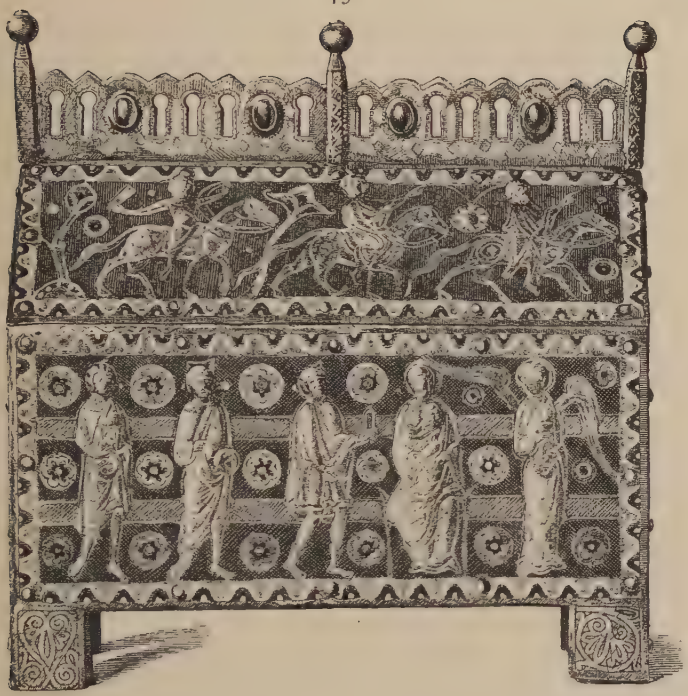
28. THIRTEENTH CENTURY CHAMPLEVÉ, LIMOGES.

29. MIXED CHAMPLEVÉ AND CLOISONNÉ ENAMEL.

task for him to beat down his design in silhouette, and build up within it thin dividing lines of metal to keep colours apart and in place, which was the natural thing to do in thin gold. Plainly the simpler thing to do in thick bronze was to dig troughs for the colour out of the solid metal.

For certain purposes it might still be advisable to use cloisons. At first gold cloisons were naturally used; but throughout the twelfth century we find champlevé helped out with cloisons of bronze (29).

That seems to indicate a stage of transition between the two methods. According to von Falke, however



30. THIRTEENTH CENTURY CHAMPLEVÉ, LIMOGES.

(than whom no one speaks with more authority), the mixed work is, on the whole, rather later in date than pure champlevé; and he argues from that, that the case of the development of German champlevé from Byzantine cloisonné is not made out. Perhaps not. But is there enough of the old work remaining, and is the date of it certain enough, to shake the not unreasonable conviction that the probable, and indeed the obvious, course of events was the actual one? The consideration of what a workman would instinctively do is also an argument, though it may be one that would have more weight with artists than with

antiquaries. The use, in the first place, of gold cloisons is not denied. Whether they were superseded by copper cloisons, and these, again, by upstanding ridges left in the ground metal, or whether the transition was straight from cloisons of gold to pure champlevé in copper, and it was only afterwards that they saw fit to revert to copper wire (which hardly seems likely), does not greatly affect the question of how champlevé came about. The likeness of it in design to cloisonné—the ridges of metal left standing were often as nearly as possible like wire lines—leaves no possible doubt as to the source from which the mediæval workman drew his inspiration. What other possible source was there?

Champlevé, it is said, was a "Gallo-Roman tradition." No doubt it was the custom of the bronze-worker to ground out pattern-work and inlay it with silver, and so forth. That is precisely why, when asked to inlay enamel, he would be likely to set about it in that way. Given the introduction of cloisonné and the desire to do something of the kind in bronze, there was nothing for it but champlevé. Any prejudice there may have been at court in favour of the goldsmith's way of doing it (and we may take a certain conservatism for granted) was bound to be overridden by practical considerations. After all it would matter little to the patron how an effect was got so long as the workman got it; and if he got it more cheaply so he would be allowed to go his own way.

The determining factor in the new development was the use of bronze. The bronze it was which suggested the method of workmanship. It decreed that the colour should be opaque, for it was impossible to preserve its translucency upon a metal containing tin enough to cloud it. The bronze it was which made possible the production of large pieces; and, in a sense, it was the

desire to produce works of considerable size which, with the prohibitive preciousness of gold, determined the use of bronze.

The mediæval enamellers began, as their Byzantine forerunners had done, with relatively small pieces of work, with circular plaques, bosses, shields, and other ornaments, to adorn a casket. Before long they found it possible to enamel the casket itself (30). Eventually they produced pieces of considerable size, though to the last they were not able to enamel anything like a life-sized figure. The effigy of Archbishop Maurice at Burgos Cathedral (31) is in wood, overlaid with sheets of gilt bronze, some of which (those in the mitre, stole, and cushion, for example) are enamelled. There is colour in the flesh too, but that is not vitreous.

31. ENAMELLED BRONZE EFFIGY OF ARCHBISHOP MAURICE, BURGOS.

At the beginning of the thirteenth century Limoges was famous for the shrines, reliquaries, and all manner of church vessels turned out of its workshops. But as the quantity of the output

increased the quality of the work declined, until, in the fourteenth century, it fell into neglect and went altogether out of fashion. Whether it was the change of fashion which led to its decline, or it was the decline of the workmanship which brought it into disfavour, may be a question. There is no question that it deserved its fate.

The use of translucent colour upon silver, a favourite practice in Italy, led to the very interesting form of work known as "Basse Taille" (Chapter XII.), and that in turn to painted enamel (Chapter XIX.), which ends in being an art apart from goldsmiths' work.

VI. RUSSIAN, HUNGARIAN AND EASTERN ENAMEL.

Nearer its Eastern source the course of enamel is no easier to follow. The pedigree of what may be called filigree enamel is not quite made out, though the relation of Magyar to Græco-Russian work, and of both to Byzantine, to which it looks as if they ought to be traced is clear. Byzantine cloisonné did not extend beyond the fourteenth century, and Hungarian wire enamel does not seem to have begun until the fifteenth. There is a gap of about a century to be filled up between the two. The earliest known Hungarian church-work appears to be home-grown, though both the wire for it and the glass paste came from Venice and Ragusa, and filigree itself, an art already established in Hungary by the end of the fourteenth century, went by the name of "Opus Ragusanum." Greek workmen, as we know, were dispersed far and wide after the taking of Constantinople by the Turks; and in the sixteenth and seventeenth centuries, if not before that, there were important depôts for Byzantine wares in Hungary.

In the sixteenth century enamel came into use for trinketry (as distinct from church plate and the like) in Transylvania. That was after the Turkish invasion. The Turks brought with them not only Oriental tastes, but Oriental workmen, and a change of style took place. After that we get wire enamel in connection with elaborate filigree.

Some similarity between Hungarian and German

work may be accounted for by the fact that apprentices who had served their time in Hungary went to Augsburg and Nuremberg to perfect themselves in their trade. They would naturally take with them the traditions in which they had been brought up, and bring back foreign notions from abroad.

The material of Russian wire enamel, "finift" or "phinipt," as it was called, was, according to Kondakow, a sort of pottery glaze derived from the Tartars; and the Oriental source of later Russian and South Slavonic "finift" is to be found, he says, in the Balkan peninsula, whence in the fifteenth century enamels were brought to the convent of Mount Athos. In Turkey, too, there seems to have been a kindred variety of "finift," related to Persian faïence, executed by Indian and Persian workmen. Kondakow's word for the stream of influence to which all this may be attributed is "Oriental-European," and it seems unsafe to try and get much nearer to a definition than that.

As for the particular kind of work described as "wire enamel" (32) it might quite well have arisen independently in any country where filigree was used; but the indications all go to suggest that it comes, directly or indirectly, from Byzantium. If it is not derived from Byzantine cloisonné—Hampel says it is not—then it was in all probability evolved out of Byzantine filigree, which certainly seems to cry out for colour.

Turning now to the far East, there are various theories as to the introduction of enamel into China; but no one any longer claims very remote antiquity for it there. Indeed, our faith in the hoary antiquity of things Chinese has of late been very rudely shaken. Porcelain itself, according to the latest authorities, goes no further back than to a dynasty extending from about two-hundred years before to two-hundred years after our

32. WIRE ENAMEL, NATIONAL MUSEUM, BUDA-PESTH.

era. Dated examples of Chinese cloisonné do not help us much. They are rare, and China is the land of forgeries.

The methods practised there correspond closely with those employed in mediæval Europe ; and the Celestials themselves, who make no claim to have invented the

art, described their production as "devil's ware," and even went so far as to specify the particular devils alluded to as French or Frankish. It is true they also called it "Arabian ware," and there is record of its introduction into South China, independently, by the Khans a century or more after it was brought from Europe. Birdwood describes it as of Turanian origin, introduced by the Yenechi. It is also said that a succession of artificers travelled across Asia and set up workshops on their way, just as in the Merovingian period Syrian workmen implanted the Byzantine arts in France.

There is little likelihood of enamelling having been practised in China until after the Mongolian invasion in the thirteenth century. The earliest known specimens are not thought to be older than about the middle of the fourteenth. These are rude in execution, imperfectly vitrified, and low in tone; and, though a century after that abundant work was done, it was not until the seventeenth century (33) that the Chinese arrived at the perfection of execution which we value in their work. Shortly before that, towards the end of the sixteenth century, enamelling found its way from China to Japan.

Enamel is not thought to be indigenous in India; and, expert as were the enamellers of Lahore and elsewhere, nothing is known of Indian work before the middle of the sixteenth century. There is a strong consensus of opinion to the effect that it was introduced from Persia, and that it is there we must seek the origin of the art. Kondakow tells of a find at Perm, in Siberia, consisting of goldsmiths' work, now in the Hermitage, enamelled with cobalt, grey blue, turquoise, and occasional pale coral pink—typically Eastern colours—supposed to be by a Persian artificer of somewhere between the third and sixth centuries; but, with that

33. FRETTED CHINESE CLOISONNÉ ENAMEL.

exception, it must be confessed we have no very ancient Persian enamel to support the supposition.

On the other hand, we read of early barbarian enamel discovered in Russia (in the district of Polosk), ascribed to the fourth, if not to the first, century, which is akin to work found in Sweden, and points, it is thought, to an early independent Slavonic art. It is even surmised that the enamel of antiquity was the product of Northern barbaric art derived from Armenia and the Caucasus. Another suggestion is that it travelled from Assyria to Egypt and was brought to Europe by the Phœnicians.

The further we go into the question of the origin of enamel, the deeper becomes the mystery in which it is involved. The one gleam of light is upon recurring points of design invariably characterised by something which we recognise as "Oriental." But there are possibly archæologists who will maintain that what strikes us as Eastern is nothing of the kind—Northern perhaps!

34. OSTRO-GOTHIC ENCLOISONED GLASS, RAVENNA.

VII. ENCLOISONED STONES AND GLASS, AND IMITATION JEWELS.

THE connection between enamelling and the jeweller's mosaic of precious or semi-precious stones and glass, in imitation of them, is too obvious not to count for something in the history of art.

Coloured glass was in its origin only an imitation of jewels, and in early days enamel also was meant to be a substitute for things more precious, if not in every case a counterfeit. It is certainly not by accident that translucent enamel takes the hue of ruby, sapphire, emerald, garnet, or topaz, and that the colours of opaque enamel are best described by the names of lapis lazuli, turquoise, coral, and so forth. Apart from

fraud, it seems as human to imitate as to err; and from the earliest days we find imitations, at first in glass and then in enamel, of anything that was precious, and especially of that which was in fashion. The earliest British use of enamel was not only confined to coral red, but occurred in the very form of those coral studs with which, according to Pliny, the "barbarians" were wont to decorate their shields and helmets.

Widely as the art of enamelling seems to have been known, it was not universally practised. But everywhere we come upon jewellery with stones, or the glass imitation of them, onlaid, inlaid, and encloisoned. Such encloisoning was, in fact, the most characteristic feature of barbaric jewellery. Witness the find at Petrossa, the cup of Chosroës (at the Bibliothèque Nationale, Paris), the crown from Guarrazar (at Madrid), and Byzantine, Merovingian, Anglo-Saxon, and "barbaric" goldsmiths' work generally (34). The notion may have come from Egypt or Syria, from Central Asia or the Sassanian Empire; in any case it is suggestive always of Oriental influence. And down to our own day coral and turquoise have been simulated not only in Eastern work, but in the European derived from it.

So Indian artificers not only incrust jade and crystal with rubies, emeralds, and other precious stones, *en cabochon*, outlined with gold, which forms also stems to the jewelled leaves and flowers and holds the pattern together, but imitate this inlay as closely as possible in enamel. Not that jade or crystal is enamelled, but that, in imitation of this Mogul work, little jewels of translucent red and green enamel framed in gold (presumably contained in little metal pans with a raised edge giving a gold outline) are inlaid into the jade, not, of course,

35. CHAMPLEVÉ ENAMEL INCRUSTED WITH JEWELS EN CABOCHON, FRENCH.

fused to it, but cemented into beds dug out for its reception.

A rather unusual mediæval combination of enamel and inlaid stones is shown on page 57, where stones *en cabochon* are used, as it were, to focus the colour.

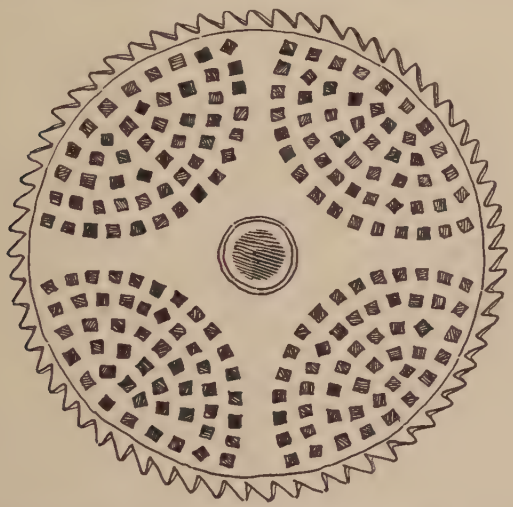
The development of enamelling was possible only in proportion as knowledge, empirical as it may have been, supplied a palette of sufficiently fusible vitreous colours. At first goldsmiths got their colours as best they could, with natural stones or glass or enamel, if they had it. Nothing which supplied the colour wanted came amiss to them; cement would do if they could get it no other way. It can hardly be said that they did not play fair: rules of the game had not yet been formulated.

Enamelling soon passed into a stage when it was something more than imitation. But there is the fact: it began as a substitute for glass, itself a makeshift for something more precious. There is no disputing the course of events, first the inlay of stones more or less precious, followed by sham jewels of glass, then the fusing of the glass into its socket, and finally enamel. When it began to be realised that this was not only a simpler and cheaper way of getting something like jewels, but a means to effects which neither jewel-setting nor its imitation would give, the future of his art lay clear before the enameller.

We may take it that the use of encloisoned bits of garnet, glass, or whatever it may have been, implies no great skill in enamelling on the part of the jeweller, and also that the introduction of enamel in the form of little rectangular cubes (36, 43) is reminiscent always of stone or glass setting.

Glass inlay, it has been said, "supplied for a time the place of enamel." It is, more properly speaking,

the obvious prelude to it. Stones must have been used before enamel. Nature made garnets and lapis and turquoises long before man invented glass flux. One cannot imagine an expert enameller going back to encloisoned jewellery. At first, indeed, so long as



36. GALLO-ROMAN BRONZE DISC WITH BLUE ENAMEL IN THE FORM OF INLAID TESSERÆ, GALLO-ROMAN.

enamel was only a makeshift, it would be held in less esteem than that which it replaced; but when once the artist came to realise the scope enamel colour gave him, there could be no thought of return to the more restricted use of encloisoned stones, except, indeed, for the boast of the thing. That is a vulgarity for which the patron, not the artist, may justly be held responsible.

That enamel was in some quarters always considered as at best a makeshift for work in precious stones, is shown by the use made of it, as, for example, in the

border, at the back only, of the Lyte jewel (page 77), where it is deliberately employed as a substitute for the rubies and sapphires shown on the face of the locket. And in the goldsmith's work of Delhi it is chiefly to the reverse side of the jewellery that the (Jaipur) enamel is confined.

The place of inlay was in old time constantly and everywhere supplied by cements of various kinds, "mastics," as they are rather vaguely called. The Chinese have a pretty way of inlaying jewellery with bits of kingfishers' feathers, which have a wonderful resemblance to cloisonné enamel, except that the hues are much more brilliant than they can get in cobalt and copper blues.

You may to this day buy in the East enamels, so called, in which the colour is simply wax floated into the cells formed by wire filigree. Given the use of inlays or cements and the practice of fusing glass inlay into cells, what more inevitable than that it should occur to someone to make a cement of glass powder which he could fuse into its metal setting, and so save all the trouble of cutting and fitting little scraps of glass together?

VIII. CLOISONNÉ.

Cloisonné was the goldsmith's way of enamelling. It belongs to the use of gold, the preciousness of which encouraged, if it did not suggest, the process. The precious material determined that it should be used thin, and its ductility made cloisonage easy. It was soldering, essentially a goldsmith's process, which first made it possible.

The ancient Greeks used, if not cloisons, something very like them. To make vitreous colour adhere to gold, fusion was necessary. Fusion meant the spreading of the colour, and the problem was how to prevent it from overflowing its boundaries. That was most simply done by soldering on a barrier, and the finest possible gold wire was enough to enclose the quite thin film of colour employed by the Greeks. As a matter of fact, we find the petals of little flowers, or whatever the form of the minute parts to which they ventured to apply colour, were outlined by a fine line of gold. Even long after that, during the Renaissance, when enamellers had great control over their colour, they still kept it within bounds by the aid of a raised line so fine that it is not until you look for it that you see it is there. The soldering on of gold wire was a favourite device of Greek and Etruscan goldsmiths, and they produced by means of it most characteristic ornament.

The Byzantine goldsmith, who first brought enamelling into artistic prominence, was accustomed to make sockets for cabochon jewels out of upstanding strips or

"tapes" of metal soldered on and afterwards bent over the edges of the stone to hold it in place. What more natural than that, when occasion arose to enclose deep layers of enamel, he should build up walls for it with these same strips of gold?

The way was long before prepared for cloisonné enamel. It involved no process with which the jeweller was not already familiar. He was in the habit of soldering on not only sockets for the reception of jewels, but actual cloisons even for his mosaics of precious stones. The network of flat wire was part of his stock in trade; all he had to do was to fill it up with a new substance. Not even that, for he was already in the habit of using glass for inlay; he had only to introduce the old substance in a new and more fusible form and, instead of bedding it in cement, to flux it into its setting. Indeed, the ancient Egyptian setting for lapis, carnelian, and other mosaic jewellery is so precisely what might have been done for enamel, that many people will have it that inlay of the sort is enamel.

Whether by way of preparation the enameller first beat down a trough in the thin plate of metal and built up his cloison walls within that, whether he applied his colour in the form of paste or of dry powder, whether he fused it in a muffle of some kind or with the blowpipe which was part of every goldsmith's paraphernalia, are matters of no consequence. He had but to fill in the cells with enamel, to fix it in the fire, to repeat the process until the colour came well up to the face of the cloisons, to grind it smooth and polish it until it was translucent, and the process of Byzantine cloisonné was perfected.

The thickness of cloisons in Byzantine work is to some extent governed by the consideration that they had

to be bent into shape, and it was necessary they should bend easily. But one meets with cloisons that look more like champlevé. There is, for example, in the Gewerbs Museum at Cologne a piece of fifteenth century Spanish work in which ornament of the usual kind is framed in strips of bronze about three-eighths of an inch thick. These form the main strap-like divisions of the design, and bear to the thinner cloisons about the proportion of the iron bars to the lead work in a thirteenth century stained glass window.

37. BYZANTINE CLOISONNÉ ENAMEL, THE ARCHANGEL MICHAEL.

The at one time unavoidable use of cloisons affected, of course, the design of enamel; it accounts for the minuteness of detail in Byzantine work, and for that network of gold lines which has such a wonderful effect upon the colour. A colourist would see at once the value of the gold line, and take it into account in his design;

38. CHINESE CLOISONNÉ ENAMEL.

but it was in the first instance not an artistic device, but a necessity of the case. Without cloisons there was no relying upon the adherence of the enamel. So essential were they to sound work that where, as in the rendering of the human face, exceptionally broad surfaces of unbroken enamel occur, cloisons have actually been used, only they are shallower than the rest, and are covered up by the last coat of enamel. This was readily fused to the enamel underlying it, and safely bridged over the submerged cloisons. Kondakow, who first pointed this out, gives in his book a convincing illustration of the way it was done.

It turns out, then, that, though we usually talk as

if cloisons were used only to enclose the enamel and to separate one colour from another, their actual function was also, as the word itself implies, to give *key* to the glass, and make it hold on to the metal. The larger the area of enamel the more likely it was to flake off. It was expedient to leave no very large unbroken surface; and, as a matter of practice, early enamellers one and all reduced the cells to the smallest possible dimensions, and broke up any mass of one colour with lines of wire, in the form of folds in drapery, feathering in wings, pattern-work, or whatever it might be. The Byzantine figure on page 63 is netted all over with fine gold lines; and in the ancient figures in the Pala d'Oro at St. Mark's (A.D. 976—1105) the draperies are so worked over with zigzags of metal, by way of expressing folds, as to have the effect of fabrics shot with gold. So in coloured draperies diapered with another colour the gold outline between the two adds such extraordinary richness to the enamel colour that we forget that it is in reality opaque. Minute detail was plainly invented for the express purpose of making the work secure. The fulness of old Japanese pattern-work was deliberately designed to avoid the difficulty presented by large surfaces. For the same reason the Chinese artist broke his coloured ground with diaper in wire. This, as it happens, goes towards harmony of colour; but, had it been otherwise, there would have been some compensation in the use of the cloison as a means of giving drawing, as, for example, on page 64, where the waves of the sea, the leaves of the trees, and the swirl of the clouds, are all given in lines of gilt metal upon the flat colour. Inscriptions in gold wire upon a coloured ground were very happily introduced into Byzantine and mediæval design.

Both in early goldsmith's work and in old enamel upon

bronze the cloisons were soldered on. It was the workmanlike thing to do. In recent years the Japanese have found that they can do without solder; and they save themselves some trouble by attaching cloisons only temporarily with gum, and trusting to the enamel itself, when it fuses, to hold them fast. One might have been disposed to speculate whether possibly the idea of thus dispensing with solder might not have arisen out of the quite modern use of cloisonné enamel upon *porcelain*, where metal tapes could easily be planted in the plastic clay, and solder was out of the question; but there are grounds for supposing Byzantine workmen already to have shirked labour in that way. The Japanese have gone still further astray from the ancient practice, and, regarding cloisons no longer as a necessity, use them only for outlining or drawing lines. They have apparently no difficulty in covering large areas with plain enamel unbroken by cloisons.

The modern tendency is to avoid them as much as possible, and to aim at a pictorial effect to which of old there was no temptation. There is no denying the wonderful effects produced. But it is not altogether prejudice in favour of more severe design which makes one hesitate to accept the new manner as an improvement upon the old. In this age of science we should be gaining every day greater control over our materials. Modern chemical research is continually opening out new possibilities; but it does not alter the nature of things. Vitreous colour and the fire that fuses it remain what they were; there is still safety in small cells; and if, as seems obvious, this new departure is made possible only by the use of a softer enamel, the use of this more perishable material can hardly be reckoned as an advance in the practice of enamelling.

IX. CHAMPLEVÉ.

Champlevé was the coppersmith's way of doing what the goldsmith did in cloisonné or in repoussé. And, just as the goldsmith used cloisons to make sockets for stone or glass before ever he thought of enamelling, so everywhere the bronze-worker was in the habit of "grounding out" ornament in a way which, no less than the encloisoned jewellery of ancient Egypt (1), suggests the possible inlaying of enamel. A striking instance of this occurs in an Egyptian libation cup in the Petit Palais at Paris.

It is in fact as natural to dig trenches for enamel out of thick copper as to beat them down in thin gold, or to build up cells within them; and the process may be said to have grown out of the use of copper itself. It results from the desire to produce work of considerable size, and from the scarcity of gold with which to do it. The continued use, in the first instance, of gold cloisons upon copper was what might have been expected. Copper cloisons were naturally thicker than cloisons of gold, less pliable, and not so easily soldered; and it was soon found to be the simpler plan to dig away the ground and leave the lines of metal upstanding. These at first had very much the appearance of cloisons, so much so that, where the two processes are used in combination, one has sometimes to look closely to distinguish which is champlevé and which cloisonné.

Before very long, however, enamellers on copper worked out a system of their own. They evolved,

that is to say, a convention proper to the method of workmanship employed. The enameller of the crucifix opposite (39) was feeling his way towards it. The figure, though champlevé, is designed very much as it might have been for cloisonné; but the scroll on the cross is "reserved" in the bronze: it is only the background to it that is in colour. The characteristically sinuous lines which come of bending about strips of metal tape very soon gave place to more angular forms, produced by scooping away the solid metal on either side of them. The multiplicity of fine lines, so easy to get in wire and so expressive of cloisonné, also disappeared. The temptation was now in the opposite direction, viz., to make use of the metal ground, broad surfaces of which formed henceforth a feature in design (28, 29, 40, &c.).

It is a distinguishing characteristic of champlevé enamel that an appreciable part of the gilt bronze should be left bare of enamel; and, indeed, a design in which that is not done, and where so much of the surface of the metal is dug away that it only appears in lines, strikes one as inappropriate to the method.

Further, lest the contrast between rich enamel and plain metal should be too great or suggest too obviously the idea of saving labour, enamellers (at this time always metal-workers, it must be remembered) had the happy thought of engraving or chasing the metal that was left bare. A common practice was to leave broad horizontal bands of metal across the background, and to enrich them with full pattern-work, rather curiously Byzantine in character for the twelfth or thirteenth century. Another plan was to reserve the pattern in metal and fill in the ground with colour (29, 40, 43, 44). That made, of course, a great difference in design.

Technically it is a matter of no consequence whether

39. EARLY CHAMPLEVÉ ENAMEL, IN THE GERMANIC MUSEUM AT NUREMBERG.

40. CHAMPLEVÉ ENAMEL IN THE CLUNY MUSEUM.

it is the pattern or its background which is left as a foil to the enamel. The significant thing is that, though colour on colour (ornament, for example, in varied colours upon a dark blue ground) is common enough in mediæval work, the usual practice in champlevé was to "reserve" a fair proportion of the metal either for the pattern or for the background to it.

With regard to figure design, the course of mediæval practice was, roughly speaking, this. At first figures were represented in colour upon a gilt ground (as they had been before in Byzantine goldsmith's work), the

41. CHAMPLEVÉ ENAMEL IN THE MUSEUM AT LIMOGES.

flesh in white or in a purplish tint (39), the metal ground diapered with engraved or chased scrollwork. In the course of the twelfth century the fashion changed, and it was the figure work which came to be "reserved" in metal on a background of enamel. That was so much the easiest thing to do. These occasional masses of gilt, in the network of gold lines breaking up the colours, were of considerable decorative value, and became a feature in champlevé design. It will readily be understood that the resort to figures entirely in metal relieved the enameller of considerable difficulty. In particular the convention of gilt flesh was a very simple and quite satisfactory solution of an awkward problem in treatment. The definition of the features (perhaps against a ground also of metal) by strong drawing lines in red or blue (86) was a practice favoured at first by the German enamellers. It was obviously easier to get drawing in lines engraved and filled in with colour than in lines left standing in the metal grounded-out for enamel on both sides of it. The effect of these lines of colour upon metal is the reverse of that got in cloisonné, where the lines are of metal upon a coloured ground.

The next step in Gothic procedure was from figures either quite flat (45) or in the lowest possible relief (41) to images practically in the round; but, though in twelfth century work the introduction of colour into the draperies helped to bring them more into focus with the picture than they were in later figure-work, devoid of colour, the effect was at the best not altogether one of unity. At the worst it was most incongruous. It is not that modelling in high relief is incompatible with colour, but that there is something unsatisfactory in the effect of little bronze dolls cast separately and attached to the face of a picture. When it happened to be only a single figure which was distinguished in this way from others so

42. PART OF AN ENAMELLED SHRINE IN THE MUSEUM AT BURGOS.

43. ELEVENTH CENTURY CHAMPLEVÉ, LIMOGES.

delicately chased as practically not to be in relief at all, the underlying symbolism was hardly enough to recommend so naïve an expression of emphasis. There is still less excuse for the applied heads, so constantly standing out in knobbly relief against the flat figures, in Limoges work of the thirteenth century (26, 41, 42).

It will be found, that where in champlevé the figure is in bronze upon a coloured ground, the enamel does not always come up to its outline, but stops short of the engraved line, giving an extra margin of metal beyond it. This Viollet le Duc accounts for by supposing the grounding out of the enamel to have been done by an artisan who was instructed to stop within a respectful distance of the line engraved by a superior artist. That might appear so in rudely executed work like that on page 76, supposing the figure draughtsman's outline to be worthy of such respect; but in the casket

opposite (43) it will be seen that the double line, a device continually employed by designers to give fulness to a design, has a very definite artistic use. Moreover, the extra line was not necessary to the preservation of the artist's drawing; for he had only to engrave his outline deep enough, and the veriest mechanic could keep to it. The difficulty of the merely mechanical workman would be (and evidently was) in drawing a line of his own outside it.

Champlevé enamellers seem to have felt the want of something like cloisons to break up large areas of colour. It was a local, not a general, custom to break up masses of enamelled ground by little dots or other diaperings

44. FOURTEENTH CENTURY CHAMPLEVÉ CLASP, LIMOGES.

45. CHAMPLEVÉ ENAMEL, LIMOGES, IN THE CHURCH OF BELLAC.

in the metal, such as occur in thirteenth century Westphalian work. These, like the rosettes on the background to the figures in the French work on page 75, were reserved, not merely for ornamental purposes, but in order to give hold to the enamel. The device was constructively the equivalent in champlevé to diapering with cloisons.

The difference between German and French champlevé is more in design than in technique, though the Rhenish artists made greater use of blended colour (Chapter XVII.). In both countries it was the practice to reserve ornament in bronze upon a coloured ground; but, whilst in Germany the scroll, varied though it was in pattern, was Byzantine or Romanesque in character (23), in France it was more Eastern-looking, especially as to its terminal floriation, in shaded colour, of an almost Persian type (45).

The bronze in Gothic work was thickly coated with an amalgam of gold and mercury fixed in the fire,

though it is now in many cases almost entirely worn away. Occasionally there is some compensation for its loss, where, for example, in Limoges work, the metal has been worked over with ornament which alone retains the gilding in its punctures, so that we get a delicate piqué pattern in bright gold upon the dull brown bronze. In other mediæval instances as well as in Celtic and more or less barbarian bronze-work that was not gilded, the metal has taken a fine green patina, which gives in some instances exceptional charm to the enamel colour embedded in it. In Chinese work, for the most part cloisonné, the gilding has stood very much better. The mercury process is, of course, superior to water gilding and to the more modern electro-gilding, by which last a very thin film of gold can be deposited.

Champlevé, though it stands for bronze-worker's enamel, was not, of course, confined entirely to bronze.

46. THE LYTE JEWEL, ENGLISH, EARLY SEVENTEENTH CENTURY.

The method was used also by gold and silversmiths when it suited their purpose. There was a very characteristic form of Renaissance goldsmith's work decorated with arabesque in gold upon white; and a more rigid and spidery form of Louis XIII. ornament, also on white, and very effective in its queer way, was introduced by Jacques Hirtu. The back of the Lyte jewel (page 77) is distinctly reminiscent of designs by Hirtu. The form of the ornament is strangely sudden; but, when the contrast is only between white enamel and glittering gold, it justifies itself entirely.

Jaipur enamel, for the most part in translucent ruby and emerald colours upon a white ground, is outlined with a fine gold line, which at first sight suggests cloisons. It is really champlevé, in which very shallow cells for the enamel have been chased out of the solid but exceptionally pure, soft, twenty-two-carat gold. The same thing was done in other parts of India.

There is in the Victoria and Albert Museum a beautiful specimen of seventeenth century Lucknow work (a bottle with white flowers and opaque grey-blue leaves upon a translucent ground) in which the gold, rather cloison-like outline is, again, the surface of the vessel upstanding between the beds of enamel. In Persian work, too, there occurs a fine gold wiry outline, which is similarly got by chasing.

"Niello" must not be confused with enamel. It was employed by Byzantine, Celtic or Anglo-Saxon, and mediæval workmen, sometimes in association with enamel; but it is really more nearly akin to damascening than to enamel; for, though it is champlevé and fused, it is not vitreous, but compounded of lead, silver, copper, sulphur, and what not. The metallic character of niello makes it peculiarly appropriate to the decoration of metals; and, being fired at a high

temperature, it is more permanent than most enamel colours. There seems, however, to be no very good reason for using the two together. It may be a safer way of filling up fine lines of engraving; but lines that are too fine to be enamelled have a way of looking rather out of accord with the rest of the work, apart from any difference of texture there may be between substances essentially different. The reason of the use of niello in Italian work was, no doubt, to get the character of pictorial engraving—a quality much better appreciated on white paper than on bright metal.

In German coppersmith's work of the twelfth and thirteenth centuries (in the Gewerbs Museum at Cologne, for instance) we meet with gilt ornament on a brown ground which one would suppose at first to be champlevé. The Germans call it "Braun-email"; but it is neither enamel nor champlevé. According to Ferdinand Luthmer, the brown is nothing more than a coating of linseed oil upon red copper, charred in the kiln to a deeper or lighter tint of brown, according to the depth of the coating and the degree to which the copper colour consequently grins through. And that is what it looks like. It is quite plain, too, that the gilt ground has not been sunk and filled in with enamel: the pattern has not the sharpness of cut metal; and where it has worn away, it is patent that it is only gilding, much in the manner of the later Venetian enamel, though the design, of course, is very different. This sort of "encaustic," which was practised on the Rhine and Maas, in Westphalia and Hesse, has proved to be almost as lasting as true enamel. Like niello, it is burnt on; but it is no more metallic than it is vitreous.

Another kind of work commonly confounded with champlevé enamel is the filling in of coloured brasses

with what is called "mastic." This may be regarded as a sort of sham enamel, though the inlaying of wood and marble with coloured mastics, more or less in imitation of inlaid marble or the like, dates back to a period far more remote than the use of enamel. It was no new thing to inlay metal with colour; the only fresh departure was to employ vitreous colour and to fuse it.

Mastic is a term so indifferently used for any resin, varnish, mortar, or cement, that it can hardly be said to describe a definite substance; but it may be safely

47 QUASI-ENAMEL, PART OF A SUIT OF ARMOUR IN THE KUNST HISTORISCHES MUSEUM AT VIENNA.

taken to indicate a stopping which, whatever it may have been, was not vitreous. The so-called enamel on mediæval brasses is not fired in. The Germans call it "kalt Email." But "cold" enamel is a contradiction in terms. The fact is that, except in the case of small shields of arms or other separate pieces of enamel occasionally affixed to it, the colour of a monumental brass is not enamel at all, but only a cheap imitation of it. It is quite probable also that the explanation of much crumbling away of more ancient enamel colour, so called, is simply that it also was not enamel, but something much more perishable than even the softest glass used by the enameller. However, by the sixteenth century, armourers and others had so far mastered the difficulty of fixing colour "cold" that some of it is to this day perfectly well preserved.

The magnificent gala suit of armour in the museum at Vienna, to which the helmet opposite (47) belongs, could hardly have been in better condition if it had really been enamelled. The pattern, which might have been designed by Peter Floetner or Virgil Solis, is a strapwork of black, vermilion, and gilt metal (the last enriched with a pattern in slight relief) upon a white ground; the white background is diapered with subsidiary ornament in bright metal, rising ever so slightly above the surface of the colour. An interesting point in this is that the sinking of the ground has been done by etching, a process seldom, if ever, used in enamelling proper, though there is no reason why, for some purposes of "grounding out," acid should not just as well be employed by the enameller as by his imitator. It is a thoroughly workmanlike way of getting champlevé, and seems to offer opportunities of which no artist need scruple to avail himself, when it suits his purpose.

X. CHAMPLEVÉ AND CLOISONNÉ.

The ruder and clumsier look of champlevé gives one always the impression that it must have been the more primitive method.

By all historical accounts it was not so. If we look upon enamel as derived from encloisoned jewellery and glass, there is no doubt *that* was as old as ancient Egypt. But setting aside Egyptian enamel, of which we have little sure evidence, and Greek, which seems to have been done, so far as it was done, either way, the first cloisonné that we know of was Byzantine, centuries earlier, it is true, than Gothic champlevé, but possibly centuries later than the earliest Celtic work, which was champlevé.

Apart from enamel on metal, champlevé (or, as a carver would call it, "grounding out") was in use from it is difficult to say how far back. On the one hand, it is more than doubtful if there was ever any enamel in the cells, which look as if they might have been made to receive it, in old Egyptian goldsmith's work; on the other, there is no doubt whatever that at about that time they used to fuse vitreous colour into a bed of clay, soapstone, or whatever would stand the fire.

Cloisonné is, in the first place, the work of goldsmiths, and of men working in comparatively thin metal, which almost compels the process of building up walls to make cells for the enamel. The strips of metal set on edge for this purpose, naturally thin, equal in width throughout, and wiry, are used

48. DETAIL OF CHINESE CLOISONNÉ, OF THE MING PERIOD.

in great profusion. The method invites elaboration. Design is consequently full and rich, covering the surface; the colour is divided and broken up by fine lines of metal, which give it the appearance of being shot with gold. Cloisonné ordained a system of design in which every detail was outlined with metal, and colour was separated from colour by a fine line of it; and the use of the metal line for drawing within the area of a single colour was a natural development from it.

The effect of the method upon design is seen no less in Chinese (48) and Japanese than in Byzantine and mediæval cloisonné (49, 29). Champlevé is the work of coppersmiths, or of men working in solid metal, which of itself suggests the digging of trenches in it for the enamel. There would be no temptation to dig out more of the ground than was necessary; and, the value of the metal as a foil to the colour being patent, the obvious thing was to leave parts of it bare, enriched only by chasing or engraving. The process suggested not only broad surfaces of metal, but thicker lines than cloisons gave, not of even thickness throughout, and more vigorously alive than the lines naturally taken by bent wire. Champlevé lent itself to silhouette, not outline, and to designs in metal upon colour or in colour upon metal; and it is not surprising that its tendency is constantly towards the heraldic practice of avoiding colour on colour. And, whether in Celtic or mediæval, Renaissance or Indian work, the influence of the method upon design is apparent. One can usually guess the process from the design. Where the contrast is between colour and colour, separated by outlines of gold, we expect cloisonné; where it is between colour and metal surfaces, we expect champlevé — not but what appearances are sometimes deceptive!

49. DETAIL OF BYZANTINE CLOISONNÉ (see 22).

Cloisonné and champlevé amount in the end to much the same thing. They are both ways of enclosing enamel, of embedding it in the metal and keeping it in place, and that more securely than is possible in incrusted enamel, notwithstanding the success of later enamellers in that way. That there are artistic compensations for the restraint imposed upon the artist by the necessity of inlaying his colour, no one with the remotest appreciation of decorative design will be disposed to deny. There is a beauty in cloisonné and champlevé yet to be surpassed, if it is to be equalled, by a more painterlike method of work.

Repoussé (page 91) is not far removed from champlevé. It is only another way of digging troughs for colour; it is as natural a thing to do when you are working in thin gold or silver, as chiselling out when it is solid bronze or brass you are using.

Although in a sense it may make no difference whether the necessary metal barrier between colours is beaten up, or cut out, or soldered on, it does affect the design. Identical effects may be produced in various ways. As a matter of fact, they seldom are, though a new process generally begins by imitating the old one. Each method suggests, when the workman is at home in it, the thing to do—the thing that is least wasteful of material (to say nothing of time and temper), the thing most surely effective, most certain to come right, most characteristic, most workmanlike, and, in a word, proper to it.

And so whoever works in cloisons comes to rely upon the line of gold they give, and makes much of it. He does not use it merely as an outline: he threads his colour with it, indulging to his eye's content in delicate elaboration and minute detail.

Working in precious gold, the Byzantine craftsman showed his respect for it by leaving bare a portion of his plaque as background; working in baser metal, the Chinese enameller covered his vase with ornament (50), relying upon the cloisons at once to define his forms and to soften his colours.

So the worker in champlevé follows the track in which he finds no unnecessary barriers to artistic expression. He soon gives over imitating wirework, and his line acquires a character of its own. He, too, leaves bare a fair amount of metal, whether in the form of pattern upon colour (40) or of background to design (28), but with a purpose of his own. It would entail great labour to ground out ornament all over it; and, seeing that metal may with advantage be used as a foil to colour, it is clearly not worth while. Plain metal asks for enrichment, and so he engraves or chases it, with the result that the patterned metal ground forms quite an interesting feature in his work, and the metal surfaces give a breadth to the design which is not easy to preserve in cloisonné The value of the metal as a foil to colour, and of relief as a contrast to the smoothly polished enamel, was felt also by the Chinese, who, even in connection with cloisonné, used dragon and other forms in high relief. The dragon on the neck of the vase opposite is a much happier instance of applied relief than is often to be found in Mediæval Gothic work.

Cloisonné (together with repoussé) was so plainly the process of the goldsmith, and champlevé the process of

50. CHINESE CLOISONNÉ VASE, 1573—1619.

the bronze-worker, each acting on the hint of the material he was working in, that, supposing it not to have been practised before, champlevé must eventually have come about, if only through the desire to produce works of greater size than was possible in a rare metal like gold. With the use of bronze there was bound to come the method appropriate to it. The bronze-worker may have begun by imitating the goldsmith; but imitation is never more than second best; to rival him he had to do something of his own; and the direction pointed out by his material was the only one in which he could hope in turn to take the lead.

It is at once an artistic and a workmanlike satisfaction to those who know, to see in work done no matter how evidence of the way it was done, and to note the effect of an artist's method upon his design; and it is a source of corresponding disappointment when it reveals nothing of the kind, or tells us that he had no more intuition or initiative of his own than to imitate effects proper to some other technique. The man may have accomplished a "tour de force," but there is small consolation in that.

An artist is the best, the only judge, one may say, of his own object and how to effect it. There will be occasions when, for example, it will answer the purpose of a worker in cloisonné to solder on strips or *plates* of metal which may suggest champlevé, or when a worker in champlevé may have occasion to use lines which suggest cloisons. It would be the narrowest of bigotry to abstain, because of a belief in one method of proceeding, from the employment of others which would serve the occasion better. An artist will use the surest means to his end; but he will also, failing any special reason to the contrary, abide by the craft of his choice, for better, for worse.

The description of cloisonné as the goldsmith's method must not be taken to imply that it could not be adapted to work in bronze, but only that to the first workers in bronze champlevé offered the readier solution of their difficulties. They did, of course, use

51. FIFTEENTH CENTURY HISPANO-MORESQUE CLOISONNÉ.

cloisonné too (51). As for the Chinese (48, 50), and after them the Japanese, they found it no less practically possible than artistically expedient to work almost exclusively in cloisonné upon bronze. How they came to adopt a practice so different from that developed in the Middle Ages by European craftsmen is an interesting subject of speculation. The Japanese, working

upon thin metal, were compelled to some such practice; but the Chinese more often cast their vessels, which were accordingly thick enough for champlevé, had they cared to use it. Were the Chinese by any chance more expert than the Limoges enamellers in soldering a hard metal like bronze, or had the Chinese instinct towards fuller pattern, more easily elaborated in wire-work, anything to do with it? We may rely upon it that out of two ways of keeping his colours apart a competent craftsman would adopt the more expedient. It would be with him a question partly of what was practicable and partly of the artistic purpose in view—though this last is a consideration which would not affect the artist of old time quite in the same way as it touches us in these days of fully developed individualism. The manner of the ancient craftsman was not so much the way of his choice as it was the way of craftsmanship. That is how traditions of workmanship came to be built up.

52. PLAQUES OF REPOUSSÉ ENAMEL FROM AN ELEVENTH CENTURY BOOK COVER IN THE TREASURY OF ST. MARK'S, VENICE.

XI. REPOUSSÉ.

To mention early enamel is to recall to most of us cloisonné and champlevé. But those were not the only processes employed of old by gold and coppersmiths. From a very early date they worked also in repoussé.

Cloisonné itself was used from the first in connection with beaten work. The early Byzantine practice was to punch down in a thin plate of gold the area to be occupied by the figure, and, within the shallow trough formed in this way, to build up in flat wire cells to keep the enamel colours asunder. The silhouette was, that is to say, repoussé, and only the details were drawn in gold wire. This was so in the case of the plaques in the crown of Charlemagne, and again in those of the crown of Constantine Monomachus at Buda-Pesth, in which the scrollwork patterning the gold ground is also beaten down to receive the colour, without aid of cloisons, excepting in the little birds amongst it, which are cloisonné. The figures in this instance are not quite flat, but very slightly convex, rising, that is to say, in the centre slightly above the gold ground.

This looks as if the enameller, instead of attaching his cloisons to the bed of the trough he had beaten down, had made separate little trays of cloisonné, which he had let into the hollows (or they may have been piercings only) and soldered in. Kondakow mentions that as a Byzantine practice. It is significant that in this instance the depth of the beaten cells forming the scroll is only about half the depth of those formed by the cloisons in the figures.

The spaces for the figures in the Pala d'Oro at St. Mark's are beaten down on a plate of plain burnished gold, sparingly relieved with ornament, and some of the nimbuses are outlined with a fillet of colour, the trough for which is beaten down, whilst a pattern on it is cloisonné.

In the Imperial Treasury at Vienna there is a sword scabbard of Sicilian workmanship in which a strap-work pattern is produced by repoussé, and the ground space is filled up with cloisons so delicate as to look like hair lines of gold dividing the opaque colours.

Both at the Louvre and in the Gewerbs Museum at Vienna there is enamel which has the appearance of champlevé, and is only perceived to be beaten work because in places the enamel has fallen out and laid bare the workmanship.

In the little plaques from a Gospel cover in the Treasury at St. Mark's at Venice (52) the pattern is simply beaten down in silver and filled in with translucent colour. There is some very similar work in the museum at Vienna, where the back of a throne on which the Madonna sits enthroned is faced with thin silver, wrought with depressed pattern filled in with what looks like white enamel. This, which is described as "West European work," may possibly not be enamel.

In the unique and remarkable specimen below, the so-called "Demetrius Tafel" in the Gewerbs Museum at Vienna, a very different and much more elaborate effect of colour is produced. The enamel is here no

53. THE "DEMETRIUS TAFEL" IN THE GEWERBS MUSEUM AT VIENNA, REPOUSSÉ ENAMEL.

longer buried in the cells, but stands up above the gold almost in the form of drops; and it has been fused a polish. The white looks like the "enamel" of the human tooth. The effect is such that it is difficult at first to believe that the little jewels of colour are

not actually lapis lazuli and other semi-precious stones. Examination leaves no doubt that they are enamel set in little sockets beaten up to receive it. The drapery of the saint and probably the horse he is riding were once enamelled also; but only the wreck of the colour remains, notwithstanding that the ground for it has been carefully tooled over to give it hold. It should be mentioned, by the way, that the remaining patch of flesh tint upon the neck is of a rosy shell colour, nowhere else that I know of to be found, which seems to anticipate by some hundreds of years the use of gold as a colouring matter in enamel.

Again, in Oriental work the cloison-like divisions between the colours are sometimes beaten up. But the more common Eastern practice was to beat down the ground and fill in with colour, leaving the metal surface to form the pattern. When this has been afterwards engraved, it is difficult sometimes to believe that the work was not done entirely with the graver. The work of Kashmir forms, together with that of Hyderabad, almost a "genre" by itself. The pattern in silver, copper, or whatever it may be, is much the same whether the ground for the blue and green enamel is cut out or hammered down; and it is in many cases only by the evidence of the back of the work, or of the inside of the vessel, that we can be sure which way it was done. Repoussé seems to have been the more usual method; but without closer inspection than glass cases allow it is never safe to say what is repoussé and what is not, and in the descriptive (?) labels of many a museum it all goes by the name of champlevé. No wonder people do not realise the part played by beaten work in enamelling!

Repoussé was employed to its most obvious purpose in designs (chased perhaps) in which the ground was

54. DETAIL OF REPOUSSÉ AND CHASED ENAMEL BOX BELOW.

sunk in order to give the pattern relief. Colour, of course, emphasised it still further. In Kashmir work the ground, instead of being all of one colour, is commonly filled in such a way as to give value to certain features in the pattern.

Each process led to the development of a style of design more or less begotten of it, though in the first instance it may have been only a means of getting an effect produced by some other method already in use, and was in that case naturally in imitation of it. Early mediæval champlevé often suggests cloisonné, and Indian chasing suggests at times both cloisonné and repoussé.

55. CHINESE BOX (COMP. 54).

In the Chinese box shown on this page the

ornament is beaten up into comparatively high relief and chased, and the ground filled in with translucent blue enamel. A very interesting and suggestive, but rather unusual, specimen of eighteenth century Chinese art is illustrated on page 97. The main lines of the design, it will be seen, are beaten up from the ground of the vessel, and within that cloisons are introduced to give detail, such as the petals of the flowers (in which, by the way, the colours are blended). The enamel is in this case not ground down, but left as it came from the kiln, "fire-polished"; and it is all the more beautiful in that it is not quite flat, but slightly convex in surface. It gains something, too, from being all raised slightly above the surface of the vase. According to Dr. Bushell, whose word should be enough, repoussé has superseded champlevé in modern Chinese enamel.

In French work of the Louis XVI. period, ornament, in gold of different colours, upon a ground of translucent blue or green, was constantly chased in relief.

An ancient alternative to champlevé and repoussé by which also the shallow cells required for enamelling were easily produced was to fret the pattern (or its ground) out of one sheet of gold and solder it on to another. The curious little plaque (58) from the eleventh century reliquary of Pepin of Aquitaine belonging to the church of Conques, but obviously not made for the place it occupies, has every appearance of having been executed in that manner. It gave sharper lines than repoussé, and had, in fact, very much the effect of champlevé, which, as we have seen, when it came to the use of baser metal not so well worth saving, naturally took its place.

This device must not be confounded with another,

producing a somewhat similar effect, which was practised in Rajputana. There are two accounts given of the way this Indian work was done. According to one, the jeweller shaped a piece of gold and soldered a gold wire round the edge, so converting it into a little tray; this he filled with red or green enamel; and whilst it

56. REPOUSSÉ AND CLOISONNÉ VASE, CHINESE.

was still soft he pressed into it another thin plate of gold fretted into a design; he submitted it to the fire again, to fuse all perfectly together, and, when it was cold, engraved the surface of the gold. According to the other, it was the tray itself which was first engraved and fretted. This was pressed down on to a piece of shaped glass softened by heat, submitted once more to the fire, and finally backed with silver foil. The two processes amount in the end to much the same thing; but the last mentioned connects it more closely with glass-working, with the practice of the barbaric bronze-workers referred to on page 18, and perhaps that of the Greek goldsmiths suggested on page 14.

Stamping and casting are processes that have also been used by enamellers. It has been suggested by De Radics that the outlines of the figures in the crown of St. Stephen at Buda-Pesth were stamped out in a mould. It does not follow from the recurrence of the same silhouette that this was quite certainly the case. Repetition might mean only economy of design, similar to that practised, for example, in thirteenth century stained glass, where the same effigy stands sometimes for various saints. Elsewhere, however, and later, stamping was certainly used. In Multan they make, according to Sir James Watt, small ornaments in what looks very much like cloisonné, but is really blocked out by means of dies. Some Chinese work is also said to have been cast.

There is in the Germanic Museum at Nuremberg what seems to be a German version in silver gilt of a French leather bookbinding of the time of Henri II. Presumably it has been stamped in one of the dies which were made at that time for embossing leather; but, if so, the flat strapwork, which is a feature in such designs, has been slightly pressed down from the edges, so as to form shallow troughs to hold enamel colour.

57. ENAMELLED CAST BRASS CANDLESTICK, ENGLISH, SEVENTEENTH CENTURY.

Casting was also used, it seems, in Russian work; and there are some brass stirrups in the Wallace collection which were certainly cast. It is especially in brass-work that casting has been used, for example in the candlesticks, andirons, and other roughish midland English work of the seventeenth century (57). And why not? In some cases it would be rash to say without close examination that it had not been employed as a basis for work that has been subsequently chased.

There seems no very good reason why "*Basse Taille*" (see Chapter XII.) should not be *stamped* in; and the circumstance that there are old plaques "enamelled on relief" of identical design points to some such mechanical means of reproduction.

58. DETAIL FROM THE RELIQUARY OF PEPIN OF AQUITAINE IN THE CHURCH OF CONQUES.

XII. "BASSE TAILLE."

Translucent colour was a survival of Byzantine tradition. But the Byzantine manner was cloisonné. It is only by exception that the colour in early mediæval champlevé is translucent; and where it does occur, as, for example, in the bowl of the Hispano-Flemish chalice in the Louvre (overleaf), it is strangely suggestive (it may be by association only) of Eastern work. The foot of this chalice is in the fourteenth century French manner.

Translucent colour opened out quite new possibilities, which were seized upon by later Gothic enamellers. It was in itself such a temptation to go further than opaque enamel allowed, that the onward step was inevitable. It led to quite a different form of art.

In digging out the trenches for his colour, the engraver naturally got an uneven surface. To smooth it would have been difficult; and it was not necessary, for the roughness gave grip to the enamel. When it was found that the broken ground of gold or silver gleamed through translucent colour and brightened it, craftsmen were quick to make artistic capital out of the discovery.

The French enamellers of the eighteenth century habitually engraved their gold, with veining or the like, to give shimmer to the colour of leaves and flowers, or, in the case of geometric diaper, to break the monotony of a sapphire or emerald background. Indian craftsmen

59. HISPANO-FLEMISH CHAMP-LEVÉ TRANS-LUCENT ENAMEL.

did much the same thing a century at least before that. There is no denying the value of the play of light produced by discreetly chasing the ground of the already-mentioned Jaipur and Lucknow goldsmiths' work, preparatory to putting on the enamel. And, short of this deliberate waking up of the colour by careful engraving, the mere inequality of surface which comes of "grounding out" the pattern is an asset of considerable value in art. That is apparent in any translucent champlevé in which the ground of the enamel has not been laboriously made even and uninteresting (60). Some very characteristic work, dating from about the beginning of the seventeenth century, was done at Lucknow. It is in translucent

sapphire and emerald, with perhaps also deep red and some turquoise, upon a plain silver or silver-gilt ground, very much in the manner employed by the Augsburg silversmiths of the latter half of the sixteenth century. And, curiously enough, there is something about the rather Persian design of it, with its long-tailed exotic birds perched amidst conventional foliage, which recalls the pattern-work of Theodor de Bry, who was, if not the designer of the Augsburg work, at least the model upon whom its designers founded themselves. This German work was used to great effect by David Altenstetter or Attemstetter, notably in the cup in the museum at Gratz, famed as the Augsburg cup, and by Christopher Angermaier, who made splendid decorative use of enamelled silver plaques introduced by way of panels into some remarkable ivory cabinets now in the National Museum at Munich. A rather later specimen of similar work upon gold is given on page 105. French work of the kind was more often upon gold, and, like the German miniature case, on a rather smaller scale. Black and white entered also into the colour scheme.

60. INDIAN KNIFE HANDLE.

There is in all this work gradation of tint sufficient for most purposes of ornament. In design of more pictorial character engraving had long before this been carried to a much further point. It is clear

that, apart from the sparkle given by an uneven ground, the colour, since it was *in* the enamel, would show richer in deep troughs, where the enamel lay thick, than in shallow ones, where there was less of it. There was a hint in that no artist could neglect. Why not engrave or chase with a view to gradation of colour? It was a simple matter to dig deeply into the metal where the colour was to be full, and less and less deeply in proportion as it was to be lighter, until a bare film over the shallowest possible engraving only just prevented the very highest lights from showing pure gold.

That is how, when the translucent enamel was ground down and polished, they arrived at what is called enamel *en basse taille*—in other words, engraving or chasing upon gold or silver with the purpose of showing gradation of colour, that is to say translucent champlevé, in which the strength of the colour was relative to, and in fact corresponded with, the depth of the engraving or chasing.

Some such development as this is so natural an outcome of conditions, that there is no saying precisely when first deliberate use may have been made of deeper cutting to get greater depth of colour; but the evidence all points to Italy as the birthplace of the idea of making use of engraving to get shading in the translucent colour. It soon penetrated into France, however. It has been suggested that one of the popes may have brought it with him to Avignon. At all events, it is at Montpelier, and not at Limoges, that we first hear of it in France. It was practised in Italy upon silver throughout the fourteenth and fifteenth centuries, and its invention is ascribed to John of Pisa as early as the year 1286. He was responsible for the famous silver altar at Arezzo.

"Basse Taille" has been described as the effort of the modeller to get in enamel the expression of relief. It

61. TRANSLUCENT ENAMEL ON GOLD, GERMAN, SEVENTEENTH CENTURY.

is inherently nothing of the kind, though it was, no doubt, carried to a point at which it becomes a sort of low relief. It is, properly speaking, not so much modelling as painting with the graver. The ground is engraved only for the purpose of getting colour gradation. Every stroke of the graver stands for a touch of colour. This is so far from being a sculptor's or modeller's work, that either craftsman would have to unlearn his habitual practice before he could accommodate his treatment to the purpose in hand. It is a great mistake, therefore, to make much of the plastic character of "Basse Taille." The process grows naturally out of the natural desire of the enameller to get gradation of colour ; and it is for the beautiful gradation of colour to be got by it, and not for any appearance of relief it may give, that it is artistically valuable. It was a way of doing in translucent colour something like what the twelfth century worker in opaque champlevé did, more clumsily, by blending his enamel colours (Chapter XVII.).

The pictorial ambition of the enameller finds its highest expression in works such as the so-called "Cup of the Kings of France and England" in the British Museum. That is a rare and very remarkable work of the end of the fourteenth century. But if writers on art are agreed to extol it as a work of art, it is because they are more interested in pictorial than in decorative art. It is very much what an illuminator of the period would have done, and an illuminator more concerned about his picture than about the page he was decorating.

The attitude is one more excusable in an illuminator, who may have regarded himself more as an illustrator than as a decorator, than in a goldsmith; and the truth is, this very clever graver's picture does not decorate the cup; it hardly seems to belong to it. If the artist had only left here and there so much as a line of

gold amidst the colour, it would have helped to connect his picture with its gold ground; it would have strengthened the work, and given force to his drawing: but he was bent on picture; and what pictorial success he achieves is at considerable cost of that decorative quality to which enamel owes so much of its charm. One can imagine figure work in "Basse Taille" threaded with cloison-like lines, binding it to a gold ground itself sufficiently relieved by colour, and frankly recognising the fact that this sort of painting is really no less goldsmiths' work than are cloisonné and repoussé. For, however painterlike the effect, it is got by the engraver's means of hollowing out. It is that which gives variety of tone, according to the depth of the translucent enamel, just as in photogravure the light and shade of the picture are according to the depth of the etching and the quantity of ink contained.

There is a little piece of enamel in the Bargello (described as of the sixteenth century, but more like fourteenth century work) in which the translucent blue ground is diversified by little five-petalled flowers, no bigger than a pea, in translucent yellow, which shows deeper towards the eye, and exposes the clear gold only on the outer edges of the petals. It is as if little concave flowers had been fixed to the ground with a pin (forming the eye of the flower) and filled in with translucent yellow.

In some of the French goldsmith's work of the eighteenth century at the Musée des Arts Décoratifs there are paler blue stars upon the dark blue ground—underlying stars of silver, I take it, upon which the translucent blue shows paler and greyer (see "Paillons," page 154).

XIII. WIRE ENAMEL, UNPOLISHED.

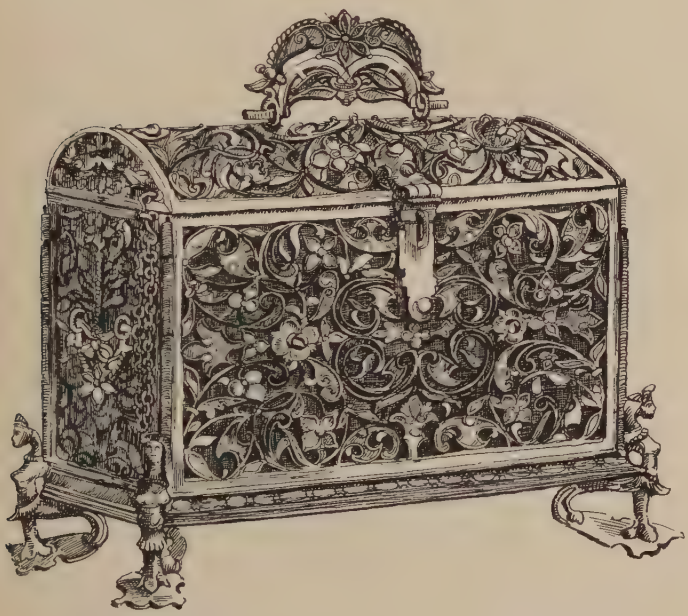
It has already been explained how in cloisonné and champlevé the cells were filled and refilled until the enamel came well up to the surface of the metal, so that it could be ground even and polished. There is, no doubt, a satisfying effect of finish about the smooth surface of mediæval champlevé or Chinese cloisonné enamel. More than that, in translucent Byzantine work and in "Basse Taille" the polish brings out the quality of the colour; and in any case a uniform texture is pleasant to the touch. But there is a pleasing quality also in the surface of enamel which has not been ground down to a level face. The undulations in it catch the light as an even plane does not. It has a liquid look. The slight shadow from the walls of the cells helps the colour; and in many respects the effect compares more than favourably with that of an absolutely flat surface.

In the little sixteenth century German casket opposite (62), the colour certainly loses nothing from the fact that it lies in hollows below the level of the cloisons, which in this case, as it happens, are of the flat tape wire ordinarily used in cloisonné. (The same sort of thing occurs in seventeenth century champlevé both in silver and in gunmetal, for example in Spanish work.)

An equally satisfactory effect is produced where the enamel rises up, as it were in thick drops, above the setting. There lives in my memory a piece of old

Chinese work in which the rounded surfaces of red enamel stand out from the metal, as though it were incrusted with coral after the manner of some seventeenth and eighteenth century Neapolitan goldsmith's onlay, which, by the way, was sometimes associated with white enamel.

In the flowers upon the Chinese vase (page 97) the



62. GERMAN CLOISONNÉ NOT FILLED UP WITH ENAMEL.

enamel, slightly convex above its boundary wires, has a beautiful surface which a glass-blower would call "fire-polished." It took a master of his trade to do that. He must have known his material thoroughly and have had perfect control over it. It was not only the natural desire to get an even surface, smooth to the touch, which suggested grinding and polishing, but practical

expediency also. The piling on of enamel and grinding it down to a face that could be polished was a much rougher and readier process.

63. OLD JAPANESE CLOISONNÉ NOT FILLED UP WITH ENAMEL.

As a rule, however, unpolished enamel lies, for obvious reasons of economy and labour-saving, below the surface of the enclosing wire or whatever it may be. The disc above, from the under-side of an old Japanese cloisonné bowl, which has had no more than one filling of enamel colour, not only shows what cloisonné enamel looks like in the unfinished condition,

64. RUSSIAN TWISTED WIRE ENAMEL.

but suggests a process which deliberately stops short of the usual practice. One can imagine how a man who in the act of enamelling in the orthodox manner arrived at a result like that might say to himself, "Hulloa! here is an effect worth aiming at!" and so begin a new custom, if not altogether a new method.

In the Chinese butterfly on page 212, which is in silver, and evidently not meant to be carried further, we see that the idea of not filling up the cells has been definitely adopted, as it was in Russian and Hungarian work (64 to 68).

But there is another obvious way in which enamel outlined with milled or twisted wire may have come about. No one who has looked at jewellery with observant eyes can have failed to notice the affinity of cloisonné enamel to filigree work. This is more than ever apparent when the cloisons are not flat tapes of

65. HUNGARIAN WIRE ENAMEL, NATIONAL MUSEUM, BUDA-PESTH.

metal set edgewise, but of the wire ordinarily used in jewellery.

66. RUSSIAN WIRE ENAMEL.

The common practice of Byzantine gold and silversmiths, from the sixth century onwards, was to set precious stones *en cabochon* in raised sockets connected by spiral ornament in twisted wire or coarse filigree. This is very much the kind of thing we find in Hungarian and Russian wire enamel. In filigree the interstices between the wires are, in fact, cells all but ready for enamel. They have only to be taken into

consideration in the design, and schemed so as to make enclosures (more or less) for separate colours, and the groundwork of wire enamel is there.

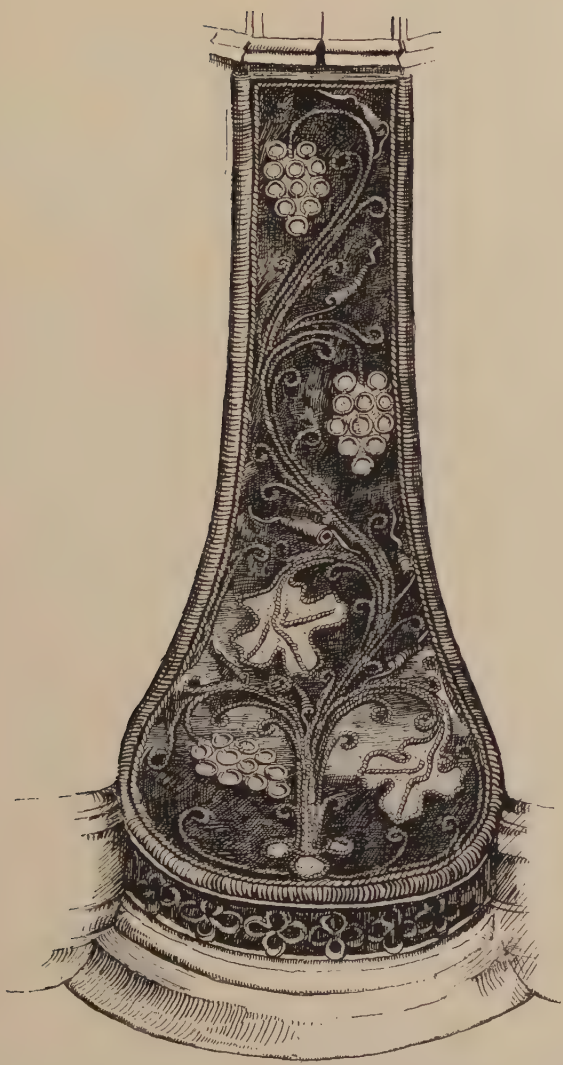
Strictly speaking, some of the very earliest enamel that we know is wire enamel. The tiny flowers, for example, which we find in Greek work (5) are outlined with gold wire so fine as to be inconspicuous; and, as in the case of wire enamel on a bolder scale, the colour

67. RUSSIAN WIRE ENAMEL.

does not fill the cells, shallow as they are, but only covers the bottom of them.

It seems strange that, considering the antiquity of filigree, cloisonné enamellers should first have used flat wire and not filigree. And it is curious also, and not without significance, that in mediæval Limoges the champlevé lines are sometimes punched with a pattern which is plainly reminiscent of milled or twisted wire.

One of the characteristics of Sicilian work, of which



68. DETAIL OF HUNGARIAN WIRE ENAMEL, SIXTEENTH CENTURY.

there is quite a representative collection in the Treasury at Vienna, is the use they made of a sort of minute filigree pattern in certain portions of the work, flooded over, as it were, with colourless or yellow flux. Bock refers to little quatrefoils of gold wire embedded in the enamel. This filigree is of wire only about half the depth of the cloisonné generally, and the enamel, not coming up to the general surface, is, of course, not polished with it.

Luthmer makes a great point of the difference between Byzantine enamel and Russian and Hungarian work, in that in the one the wires are on the same surface as the enamel, and in the others they stand up above it. In this Sicilian work the minute filigree referred to is in slight relief; but, whether the enamel is level with the wire or not, the initial operation is the same; and the mere stopping short of a perfected process does not amount to a new technique. What if the one kind of work is in flat wire, and the other in milled or twisted wire? What if in the one the cells are filled up, and in the other they are only partly filled? What if in the one the enamel is ground to a face and polished, and in the other it is left as it came out of the fire? What if the one was employed largely in picture work, and the other entirely in ornament? It is in every case cell-work, and the cells are of wire.

The decorative use made of wire enamel in Russian and Hungarian art is characteristically national: that is something to be proud of; but to claim that it is an altogether independent art seems to be a misdirection of patriotic self-glorification. In effect, no doubt, the results of Magyar and other wire enamel are very different from those of ordinary cloisonné. We are reminded by it less of Byzantine or mediæval enamel than of appliqué embroidery. The most casual observer

must, one would think, have been struck at times by its resemblance (64, 66) to that kind of needlework in which onlays of different-coloured stuffs are outlined with gold cord, couched down, to cover and clean up the joints. The wire stands up in just about the same relief; it is often twisted, after the manner of a gold or silken cord; and it is used, like the couched cord (singly or doubled), to form the golden stalks of coloured leaves and flowers. Of course we have already in Byzantine enamel conventional flowers and leaves (in opaque colour on a translucent ground) growing from stems represented by

69. HUNGARIAN WIRE ENAMEL WITH FRETTED GROUND.

gold cloisons; but the suggestion of embroidery in this wire enamel is really obvious; and when it is remembered that there is in the Waddesdon Room at the British Museum a silver-gilt cup enriched with actual pearl embroidery on cloth of gold, it will hardly seem fanciful to say that "wire enamel" looks like a translation of appliqué embroidery into enamel. Typical examples of twisted wire enamel occur on pages 111, 115. Variation in the colour of the ground (page 113) occurs frequently in Hungarian work. Often the pattern is entirely in filigree upon a ground partly in one colour, partly in another.

The wirework in the section of a chalice foot shown on page 115 has much less the air of enclosing than of being embedded in enamel, especially when it comes to actual tendrils, the coils of which rise well above the twisted stalks and outlines of the leaves. It would be difficult to find a more expressive example than this of the kind of line which comes of bent wire. As for the berry shapes, it will easily be understood how, by the simple device of winding wire closely round a circular spit of steel (like the string on a bat handle) and then ripping up this casing, the coil would fall to pieces in just such little rings. The enameller has not taken even the trouble to join them up. In the same way, other simple forms can easily be shaped ready for use as leaves, flower petals, or other forms of ornament.

A common practice in Hungarian jewellery was to fret away the ground of the design decorated in cloisonné enamel, and to attach the fretted metal to a plate of a different metal—that is to say, silver on gilt or gold on silver (page 117). Something of the same sort occurs in Venetian work of about 1600, and in the German casket on page 109. You can see in the detail on page 119 the rivets which attach the open enamel to the metal plate backing it. The difference in level between the ornament and its backing and the slight shadow cast by the fretwork upon the ground add to the effect. There is in the Gewerbs Museum at Berlin some seventeenth century German cloisonné on a silver ground punched with small holes, which give it the appearance of silver net; and in the British Museum there is some seventeenth century unpolished champlevé in silver, not unlike cloisonné in appearance, the ground of which is not enamelled, but delicately punched over to give it texture.

An Eastern device constantly employed in sixteenth

and seventeenth century Hungarian work was to make a fretted holder for a metal cup. That on page 51 is of wire cloisonné; in other cases it was champlevé. The same sort of thing occurs in Turkish and in some Indian (Lucknow) work, and in seventeenth century Russian enamel.

A charming effect is produced in a sixteenth century watch-case by not only fretting away the ground, but tying the fretwork of enamel together with what a lace-worker would call "brides" of gold. These have

70. DETAIL OF GERMAN CASKET ON PAGE 109.

a very lacelike look over the silver under-case seen through them, though they are champlevé.

There are two varieties of wire enamel characteristic of two different periods. In the first the wirework is only by way of outline and enclosure to the enamel, as on pages 111, 115; in the other there is associated with it also filigree of the usual kind, bare of colour. In Hungarian jewellery of the seventeenth century filigree plays sometimes an even more important part than enamel; and when, as often happens, the wire enamel is literally planted on the filigree work, applied, as it were, in jewels (page 120), the effect is very far removed indeed from ordinary cloisonné. But whether it is the enameller who makes use of filigree or the

71 HUNGARIAN FILIGREE AND WIRE ENAMEL

filigree worker who makes use of enamel, the process is inherently the same, and always a variety of cloisonné.

That this kind of thing is not confined to Hungary and Russia is witnessed by a Chinese vase in the Victoria and Albert Museum in silver-gilt filigree, with medallions of cloisonné enamel. And, indeed, we detect in Hungarian and Russian work a distinctly "Eastern" look. Hampel objects to the word Eastern that it is indefinite; but it is better to be indefinite than inexact. The fact is, we do not very definitely know the source of this art; but anyone can see that there is in its design something which is certainly not of Western origin; and "Eastern" expresses, however vaguely, that vague something.

The quasi-Oriental character of Russian and Hungarian enamel is probably due to immediate intercourse with the East; and racial intermixture may have something to do with the sympathetic adoption of Eastern ornamental methods; but even this is matter of speculation. What we do know positively is that wire enamel, as we find it, is subsequent both to filigree and to cloisonné. It is the sort of thing which might have occurred to any filigree worker coming in contact with enamel, or to any enameller coming in contact with filigree; and with either it would have been a

matter not of choice but of necessity to leave his work unground and unpolished, except by the fire.

The workman's ideal is perfect finish. An enameller regards the little pits in the surface of his work (air bubbles burst in the process of polishing) as flaws. So they are. And, in so far as a highly polished and speckless surface signifies perfect fusion of the enamel, it is the guarantee of good workmanship. It is technically a fault in old Chinese work that it is so pitted with air-holes. The Thibetan work (whether done by Chinese workmen at Lhassa or in China to the order of Thibet) is rough to a degree hardly to be excused as finish. From the point of view of artistic effect there is, however, something to be said for it. An even surface is not everything; and the glassy face of Chinese cloisonné, as offered to us by the dealers, is due, they say, to a final "furbishing up" in this country.

A high polish, it is contended, has helped to preserve the ancient enamel which remains to this day in good condition. Is it not rather to the perfect vitrification which allows high polish, than to the polishing process, that we owe its preservation?

Anyway there is a beauty in enamel not speckless, not highly polished, and, for that matter, not polished at all, except by fusion.

72. HUNGARIAN PAINTED CLOISONNÉ ENAMEL.

XIV. PAINTED CLOISONNÉ.

It is convenient to describe Byzantine enamel as cloisonné, mediæval as champlevé, and so forth, as though at one period only one method had been practised. As a matter of fact, it was quite usual for two processes to be employed concurrently, and in the same piece of work. Repoussé was used in conjunction with Byzantine cloisonné, cloisonné with mediæval champlevé, and both champlevé and repoussé with Chinese cloisonné.

We cannot even draw a hard and fast line on the one side of which are cloisonné and champlevé, and on the other is *painted* enamel (Chapter XIX.). Jewellers did not hesitate to supplement "cell" work with painting. Hungarian and Russian goldsmiths of the sixteenth and seventeenth centuries constantly did so, with the object, it is plain, of qualifying a tint which did not go well with the rest. They would have preferred perhaps to use only jewel-like colours; but such colours were not forthcoming in the desired variety; and failing a translucent enamel of the colour required, they had to put up with an opaque one. Light blue is a case in point. The pale opaque blue produced by the admixture of tin was, however, so totally out of relation to

translucent surroundings that something had to be done to keep it down. A simple means of doing this was by tracing black lines upon it; and they had the wit to break up the surface of aggressively opaque colours with black, so that they showed only in comparatively small pattern-work. In the buckle, opposite (72) some of the lobed leaves are plain; those are in translucent colour. Others are broken up with detail: those are in opaque colour. The painter has used his black just as a thirteenth century glass painter used opaque brown, to define the detail of his more minute conventional leafage.

You will find in seventeenth century Russian work green hatched with black, and yellow with red; but delicate leafy or arabesque pencilling was the more satisfactory way of reducing the colour. White was, of course, in its naked state, even a greater shock to the eye than opaque colour, and it was customary to veil it with red or black, as the case might be. The tulips below (73) are traced in red. There were various ways of breaking the white: by feathering at the edges (72); by veining; by dots and spots of red. Or the petals of a flower, first laid in in white, would be painted red, except for a margin left clear all round them. In Russian work you may meet with cloisonné

73. HUNGARIAN PAINTED WIRE AND FILIGREE ENAMEL.

upon a white ground with additional leaves simply traced in red upon the white.

A compromise between the use of opaque and of translucent colour was, to glaze white with a film of yellow or turquoise. In that case the colour might either be put on flat or shaded off into the white. In sixteenth century work, and especially in seventeenth century Hungarian jewellery, flowers were tinted, shaded, and pencilled, so as to give as nearly

74. PAINTED WIRE ENAMEL, GEWERBS MUSEUM, BUDA-PESTH.

as might be the effect of the natural flower. The tulips on page 123 are treated somewhat in this way.

In Jaipur enamel of a century or so ago (which, by the way, was chased or champlevé), the ornament is in translucent colours, but the animals in its midst are first laid in with white and then elaborately painted to give the fur or feathering of the little creatures.

In the Persian enamel (or some of it) which looks so much like floral illumination, the white ground upon which roses and other flowers are painted is not, as one might think, a flat layer of tin enamel. Close inspection

75. PAINTED CLOISONNÉ, NATIONAL MUSEUM BUDA-PESTH.

shows fine lines of gold following more or less the outline of the flowers; from which it appears that it is really in cells, chased out of the gold. The flowers in the panels of the pipe-holder opposite are champlevé, filled in with white, and traced with red or blue and black, to distinguish them from the white ground.

There seems no very good reason why colour should be spotted with white, as it sometimes was; and the seventeenth century experiment of dotting translucent green with white, or black with white and pale yellow, or a middle colour with both black and white, has not proved very successful.

Champlevé, or rather "Basse Taille" (for there was always chasing or engraving under the translucent colour, either as a sort of conventional veining to the leafage or by way of diaper upon the ground), was almost invariably supplemented by painting in the exquisitely finished snuff-boxes, watches, "etuis," and other trifles in fashion at the court of Louis XVI. The leaves of the flowers were usually in translucent green or blue; the flowers themselves were in white, slightly raised above the surface of the metal, and painted with the red of the carnation, the blue of the forget-me-not, and so forth. The effect, in its pretty little way, is charming. The idea of figure subjects, champlevé upon a gold ground, filled in with white, and then painted in colours, does not work out happily.

Another unsatisfactory combination of enclosed and painted enamel occurs in an eighteenth century Chinese vase in the British Museum. It is of the usual cloisonné character, with medallion panels of painted enamel, in one case a blue dragon on a yellow ground outlined in white, in the other pink flowers with green leaves on a greyish white ground. The incongruity of the result almost sets one's teeth on edge.

76. PERSIAN PAINTED CHAMPLEVÉ PIPE HEAD.

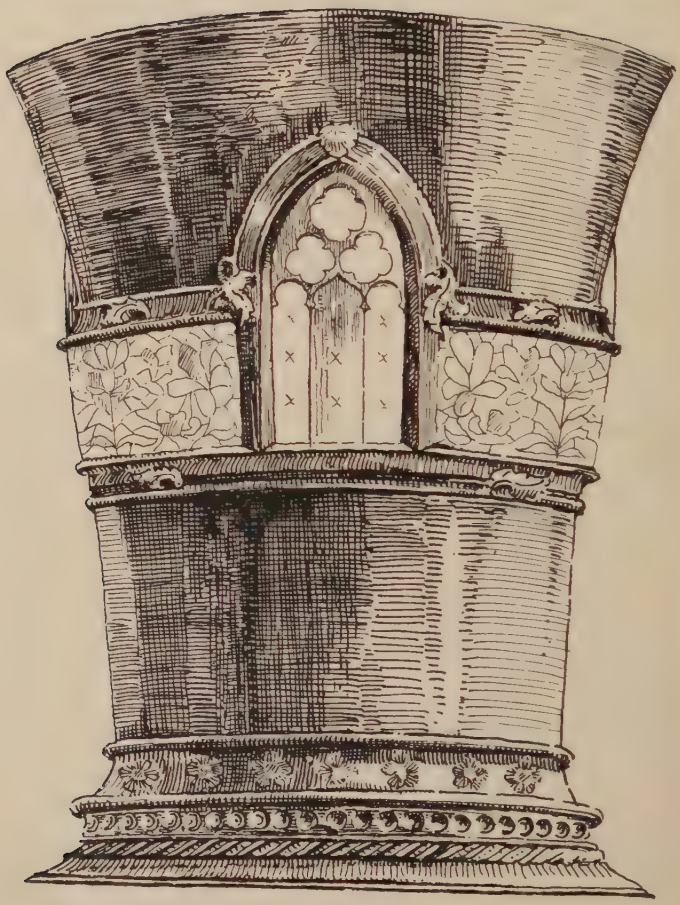
A mixture of methods is of such common occurrence that it can hardly be called the exception to a rule. And one method may come so timely to the help of another that there is every temptation to adopt it. We may have a prejudice in favour of playing a very strict game, we may realise that a certain unity of effect is secured by the use of one only method, and yet acknowledge the artist's entire freedom to employ whatever process comes conveniently to his hand. Unless the results are incongruous no objection can be taken to his use of a multiplicity of methods; and then all that the objector can say is that he has failed in artistic discretion.

XV. "PLIQUE À JOUR."

Translucent enamel reaches the furthest possible point of translucency in what is known as "plique à jour," which might almost be described as the addition, not so much of glass to metal as of metal to glass.

It may be either cloisonné or champlevé. In the latter case it is simply a fret of metal in which the pierced parts are glazed with enamel. In either case the metal cells have no bottom, and the light shines, as it were, through stained glass in miniature, which, in fact, it is. Enamel of this description is a sort of window work, in which, supposing it to be cloisonné, filigree of wire takes the place of the lead glazing in mediæval glass, or, supposing it to be champlevé, fretted gold or silver takes the place of the pierced plaster-work into which in Eastern architecture the little bits of coloured glass were stuck. In the fifteenth century cup in the Victoria and Albert Museum illustrated overleaf (77) a band of more or less scroll-like "plique à jour" ornament is broken by two diminutive three-light Gothic windows glazed in enamel.

"Plique à jour" has its equivalent also in pottery. There is a form of Chinese porcelain and of porcelain-like Persian earthenware in which the clay, whilst in a half-dry condition, is pierced with pattern, usually more or less geometric; the glaze clogs the perforations, and when fused fills them in with a stopping of translucent glass, which gleams slightly greenish against the white of the denser ware. As the incisions happen to

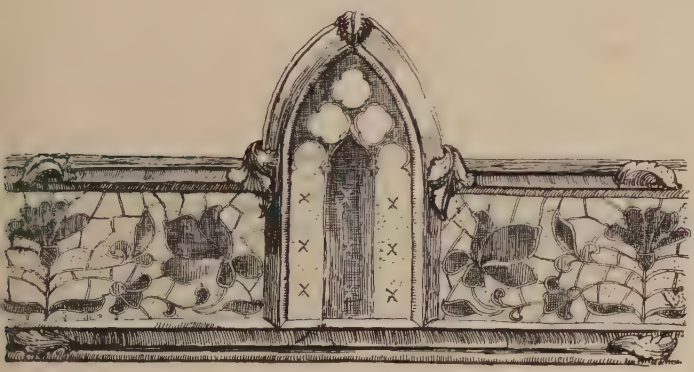


77. "PLIQUE À JOUR" ENAMELLED CUP, FIFTEENTH CENTURY.

be commonly something like a grain of rice in shape, the French have given this kind of decoration the rather foolish name of "grain de ris"; and we have rather foolishly adopted it in this country.

The resemblance of perforated porcelain to "plique à jour" enamel is more striking still when, as in some modern French porcelain shown at the Paris Exhibition of 1900, the piercings are filled in with various bright-coloured glazes.

Early examples of "plique à jour" are very rare Perhaps the earliest known is in the crown of St. Stephen (it boasts a pedigree from 1072), which has a cresting enriched with scalework in translucent emerald. The manner has been brought to some technical perfection in Russia and in Scandinavia. Indeed, this open work goes sometimes by the name of Russian enamel. The effect of it is really wonderful. It strikes you, the first time you see it, as little short of marvellous. But the whole secret of it is in getting enamel of the right consistency, viscous enough to hold on to the metal at the edges (as a soap bubble



78. DETAIL OF "PLIQUE À JOUR" CUP (77).

would), not so fluid as to flow free when it is partially melted. The operation is made easier by the use of a temporary backing of metal foil. This gives for the time being a bottom to the cells, and can be removed when the enamel (or the first coat of it) is hard.

"Plique à jour" is a natural sequel to the practice of framing together precious stones, which, genuine or not, showed to advantage when set "open." The cup of Chosroes in the Bibliotheque Nationale at Paris may be regarded as foretelling it. It was sure to come about as soon as the enameller had control enough over his material to get, at a relatively small cost, something like the colour, if not the effect, of very costly jewellery.

A possible origin of enamel unsupported by any metal backing is suggested by the discovery (I forget where I saw it) of a thin plate of silver enamelled on both sides, a portion of which had given way in the firing, and showed there clear enamel. An enameller might very well have made a trial upon a piece of silver which happened to have a hole in it. If, when it came out of the kiln, he found this coated with glaze, as very likely he might, he would naturally push his discovery further; a vision would flash before him of jewels of light caught in a mesh of golden wire; and the realisation of his dream would be only a matter of persistent experiment.

79. INCRUSTED ENAMEL.

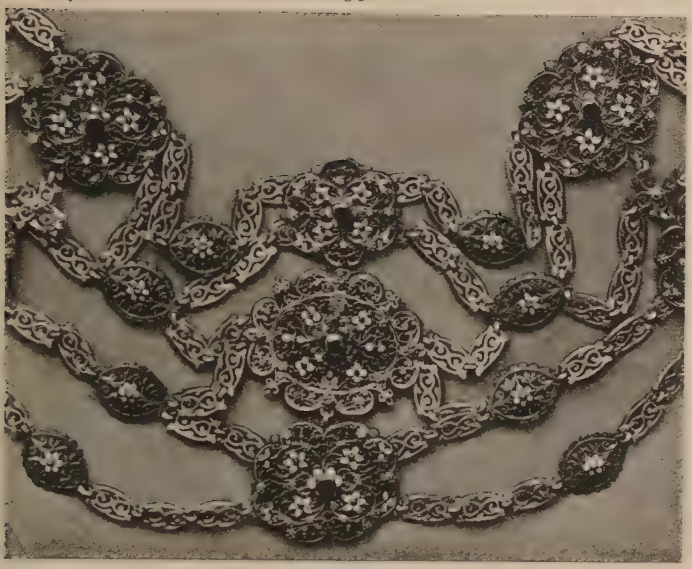
XVI. INCRUSTED ENAMEL.

"INCRUSTED" is a term that has been used by different writers to mean very different things. It is necessary, therefore, to explain the sense in which it is here used. Whatever enamel is put upon metal may, strictly speaking, be said to incrust it. But we have already well-defined terms for most of the processes employed by the enameller. It seems to me, therefore, as well to reserve the term "incrusted" for the method of coating raised and modelled goldsmith's work with colour which is neither entrenched, like champlevé and cloisonné, nor painted, like the Limoges work, upon a practically flat foundation.

It is the impulse of the natural man to kick against limitations, however wise it might be of him to accept them. Goldsmiths would, no doubt, from the first

have painted their work freely if they had been able. But they could not do without some sort of troughs or cells for the colour. The Greeks used their colour very much as though it were paint of the ordinary kind; but it was bounded by a fine line of gold wire. Kondakow

80. FIFTEENTH CENTURY SILVERSMITHS' WORK, THE FLOWERS INCRUSTED ALTERNATELY WITH WHITE AND TRANSLUCENT RUBY ENAMEL.



81. SILVER ENRICHED WITH OPAQUE AND TRANSLUCENT ENAMEL.

gives a very interesting diagram to show how the Byzantine enameller, when he wanted to cover a comparatively large surface, used shallow cloisons hidden from sight only by the last coat of enamel, which, having something to hold on to in the already firmly secured enamel below, could safely be carried over them.

The earliest specimen of incrustation I have seen is on the "Demetrius Tafel" (page 93); but it has not lasted well: only a remnant of the shell-pink clings to the neck of the saint.

In the fourteenth century goldsmiths acquired more mastery over their colour, and by the sixteenth they seem to have been able to do pretty much what they wanted with it. They did really wonderful things,

carrying technique to a point of rather trivial perfection in little bunches and bouquets of metal flowers most exquisitely painted in the colours of nature. A larger treatment is shown in the spray of goldsmith's work on page 133. Not only in the fifteenth century, as in the red and white roses on page 134, but in the best work of the Renaissance, French or Italian, no matter where it was done, there is usually an edging of gold to the colours, as also in the Hungarian jewellery on page 135, so delicate as hardly to be seen. And where it is not to be seen, nearer inspection would very likely show a line of gold, however fine, which was enough to prevent any overflow of enamel. The colour has in some cases spread over the shallow outline, and more or less buried it.

In the Venetian mirror frame in the Louvre made for Marie de Medici (*circa* 1600) the colours are edged with a fine line of gold. In earlier work there are very often little spots or stars of gold or silver, little islands of metal in the colour, the real purpose of which is to afford moorings for the enamel.

They seem in the sixteenth century to have had no difficulty in incrusting relief work with enamel, and some of it has lasted well. A chased surface naturally gave better hold than a smooth one. But the only sure way of getting deep colour that would hold was by successive coats of thin enamel, each fused by a separate firing.

From the sixteenth to the eighteenth century abundant use of white enamel was made in jewellery as a foil to translucent colour. It was used in that way in the border of the Lyte jewel (page 77). It occurs also in little pearls more or less upstanding. Sometimes it is used as a ground for other colours. Very often it is broken up with black, either in the form of pattern-work

82. DETAILS OF ENAMELLED JEWELLERY IN THE NATIONAL MUSEUM AT BUDA-PESTH.

83. NINETEENTH CENTURY JAPANESE SILVERSMITH'S WORK, THE FLOWERS INCRUSTED WITH TRANSLUCENT AND OPAQUE ENAMEL.

or of veining and hatching. There is on a Louis XIII. locket in the Louvre a pattern of flower-work in relief, all in white with a very fine gold outline, the hollows filled in with an umber colour most pleasing in effect. There is sometimes in incrusted enamel a wash of colour upon the white. Other opaque enamels are also used, as grey, blue, mauve, and pale green; but they are tame in comparison with translucent colours, to which the chasing of the ground gives extraordinary brilliancy.

A beautiful effect is produced in the Japanese vase opposite (83), in which the flowers are distinguished from the leaves, all in raised work, by enamel colour for the most part translucent.

XVII. BLENDED COLOURS.

The blending or shading of colours begins already in Byzantine work. It occurs, for example, in the background to engraved metal figures in the portable altar of Eilbertus in the Gewerbs Museum at Vienna, which is shaded from green to blue and from purple to white. In Gothic work it is usual enough, more so, however, in the thirteenth than in the twelfth and eleventh centuries. The German enamellers were particularly addicted to it, shading off one colour as gradually as they could into another—blue, for example, through green to yellow, through grey-blue or turquoise to white—whereas in Limoges the change of colour was more often quite sudden, as, for example, from red to blue.

The endeavour to get an intermediate shade between two colours by mixing them together, or to lighten a colour by shading it off into white, is not always very successful in early work. The particles were often not melted into an even colour, but only fused together, so as to give a *granular* effect. That is very frequently to be seen in the intermediate shades between manganese purple and white, which are nearly always granular in appearance, especially in twelfth century work. In the Geoffrey Plantagenet panel at Le Mans, belonging to the latter half of the twelfth century (opposite, 84), the palest shade of blue proves on close inspection to be made up of pale blue and white, and the paler green of green and yellow. There is no possible mistake as to

84. GRAVE PLATE OF GEOFFREY PLANTAGENET, NOW IN THE MUSEUM AT LE MANS.

the way in which the blue and green were reduced by the addition of white and yellow.

In the De Valence casket opposite (85) the colour of the rampant lion is a speckled mixture of blue, red, and some white particles. There is, again, a figure in the museum at Troyes—it was shown at Paris in 1900—in which the purple drapery resolves itself on close inspection into grains of dark blue and sealing-wax red. These are doubtless instances of making the best of it. The enamellers would have dissolved the colours into a tint if they could; but they had the wit to take advantage of the fact that hard colours would not blend into one, and to make artistic use of the speckle which resulted from the separate particles.

They used them also to suggest, if not to simulate, marble. There is a twelfth century plaque in the Victoria and Albert Museum by Godfrey de Clair in which the speckling of red, green, and white upon a column between two figures was certainly intentional; and there is just such another dappled pillar in the British Museum, described as twelfth century Rhenish, which is probably by the same hand. In the Verdun altar at Klosterneuburg, again, use is made of a broken turquoise blue which looks like intentional marbling.

When by chance one colour "stains out" into the next the transition from one to the other is made easy; but this softening effect seems only to have happened by chance. It is rather odd that so little advantage, if any, seems to have been taken of a happy accident of this kind.

It is in the shading of drapery that the greatest use was made of tints not separately entrenched. There was often a line of lighter colour on one side of a fold, as if a narrow trench had been scraped out next the metal and filled in with a paler tint, or it might be with white.

85. DETAIL OF HERALDIC CASKET, LIMOGES.

Similar lines of relatively light colour mark sometimes the lesser folds without the support of metal on one side of them (86). Gradation or other change of colour occurs also in ornament. The rather Persian-looking terminal foliations of the metal scroll peculiar to Limoges are usually illuminated with colour shading off to white (45); and the little discs or spots on the ground, which are a feature in rather late work, are usually coloured in rings (26).

Dots of red on green, blue on red, or, more often, of white on colour, are common both in Limoges and Rhenish enamel. They are for the most part rather irregular in shape, at times, indeed, so blurred in outline as to form, properly speaking, rather patches than definite dots of colour. They are, in fact, of just that

indeterminate shape which would result from making depressions in the paste with, say, a pointed stick, and filling them with enamel of another colour. The process of scratching out lines whilst the paste was in the right condition and filling them up with paste or powder of another colour, already referred to apropos of drapery folds, was carried further still, as, for example, in some German work at the British Museum, where a man's blue hosen are diapered with a trellis pattern of red cross lines forming diamonds, in the centre of which are spots of white. This amounts to a sort of sgraffito.

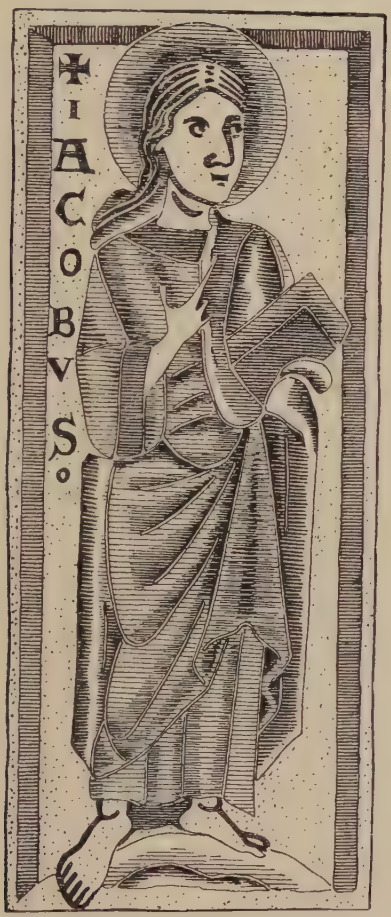
There are in the Victoria and Albert Museum some thirteenth century Rhenish champlevé figures in which, though the eyes are outlined with cloisons, there is no dividing metal between the white of the eye and the blue iris.

Dots of white on red and blue, and of colour upon colour, without metal to separate them, occur again in Gallo-Roman, Romano-British, and other work of the late Roman period, which must almost certainly have been done by the method of scratching out and filling in above mentioned.

Certain very definite spots of, for example, opaque yellow upon translucent blue or green in Irish work (assuming it to be enamel and not glass), are not so easily accounted for, unless they were engraved upon the hard enamel, filled in afresh, and fired again.

Change of colour without intervening metal is sometimes introduced in a very knowing way. In French work, for example, where the scroll is in metal upon a blue ground, the little pointed spaces of ground between the lobes of the trefoiled foliation are occasionally filled in with red, in such a way as to become part of the pattern, as though it were an afterthought when the grounding out was already done. In rude English work the

colours are filled in rather casually. The black, white, and green in the background of the candlestick on page 99 are not always separated by the brass ornament in relief.



86. TWELFTH CENTURY FIGURE BY GODFREY DE CLAIRE, NOW IN THE BRITISH MUSEUM.

The colours are most perfectly blended in the flowers upon the Chinese vase on page 97. In Japanese work also the colours are often blended (page 138).

A twelfth century Limoges shrine in the possession of the Society of Antiquaries suggests an interesting problem. There are in it some little half-discs shaded from red through grey to white. Fracture shows that the red colour of the eye is continued under the grey, but not under the white line round the rim. Was this done by first piling up a little heap of red, filling in the trench round it with grey, scratching out a line of white next the rim, and filling that in with white? There is some red, green, and yellow shading which suggests a similar proceeding. In each case the red falls under the colour surrounding it and not under the colour next the rim. Elsewhere in this same casket, where dark cobalt blue has flaked off, there is red to be seen. I have noticed the same thing in a casket in the Germanic Museum at Nuremberg. It looks as if they had found red a good colour for a first layer, with more affinity for the copper, and helping, therefore, to bind the other colour to it; but the red may be only oxidization after all.

Kondakow mentions in old work of Gallo-Rhenish type from South Russia a comparatively thick bed of red next the bronze, and on that thin coats of red, turquoise, and orange; but as on analysis this proved to be red lead, it could not have been fired, and was not enamel at all, but glass inlay.

In Egyptian work we find a cement very much the colour of red lead as a base or bed for glass inlay into pottery, and, I think, also in goldsmith's work.

87. ENAMEL ON GLASS, BRITISH MUSEUM.

XVIII. ENAMEL "EN RÉSILLE."

THERE are some forms of enamelling which, though not upon metal, come strictly within the definition of enamel, and seem to be more nearly related to enamelling upon metal than to glass, porcelain, or whatever may be the ground upon which it is done. There is no denying the title of enamel to the Japanese cloisonné upon porcelain. It dates, according to Bowes, no further back than 1869. At first it was upon a green ground always, but afterwards upon turquoise and other colours. The process employed was to embed cloisons in the china clay whilst it was in a state neither too dry to admit them nor too moist to hold them upright, and then proceed to fill in the enamel in the usual way, finally grinding it down to an even surface.

The enamel was soft, fired at a low temperature, and consequently took but a dull polish. There is theoretically a sort of consistency in decorating semi-vitreous porcelain with wholly vitreous enamel; but, whether it is that we cannot help associating cloisons

with a metal base, or because the white body, which comes inevitably to the surface in the rim of the vessel, glares at you in savage contrast to the dead colour, somehow the effect is not satisfactory.

In Indian Mogul work we get enamel in imitation of the rubies and emeralds which they inlaid into jade and crystal. This, however, is not enamelling upon jade or crystal, but inlay of enamel into it. The enamel, that is to say, is contained in little pans of gold, first fired, and then cemented into cavities dug out for it in the stone.

Similarly the enamel upon "mother-o'-pearl," of which there are numerous examples in the museum at Vienna, consists, of course, only of little jewels of cloisonné upon gold or silver, riveted or otherwise attached to its surface. Beautiful effects have been produced in that way; but it is not a very direct or workmanlike one.

The negative, as it were, to this positive was a device sometimes employed in Flemish work, in which a design fretted in silver (it might be ornament; it might be figures in low relief) was fixed over a plate of metal separately enamelled. The same kind of thing has been done in modern English silversmith's work, and the result is sometimes all that could be wished; but it bespeaks rather the silversmith who has no great control over his colour than the accomplished enameller: it is not quite the strict game.

There is some relationship, if no very obvious resemblance, between the Indian enamel inlay of the Moguls and some work done by French goldsmiths of the late sixteenth and early seventeenth centuries, in which small objects of glass (for the most part of dark opaque colour—when it was clear and colourless it was called crystal) are decorated, more or

less in the style of Etienne de Laune, with ornament in translucent and opaque colours, outlined with gold (87, 88). M. Fontenay thinks it was executed very much in the same way. The rather roundabout process of execution he describes is:—fretting the ornament in gold, laying it face downwards, and pouring on to it from the back a mass of molten glass, to be pressed well into the interstices, then grinding

88. ENLARGED DETAIL OF "ÉMAIL EN RÉSILLE."

down and polishing the face, and digging troughs out of the gold, to be enamelled in the usual manner. That would certainly account for the result, which it is interesting to compare with the method already suggested (page 18) as having possibly been used in some of the old Celtic bronze work. But a more plausible suggestion is, that the bed for the gold was cut out of the glass in its hard state. As to the gold (it is plain, from its remaining in cavities from which the enamel has fallen out, that there was a layer of

gold between the glass and the enamel), it may have been, as they say, an amalgam beaten solid and then scooped out ; but a simpler process would have been to press thick gold foil into the hollows, and so make a lining for the enamel, the edge of which would be enough to give the fine gold outline which, I suppose, gives this work its French name, "émail en résille."

There is no doubt that ornament was sometimes engraved on hard glass or enamel and filled in with gold. We have at the British Museum a little plaque decorated entirely in gold arabesque which could only have been done in that way.

The practice of fusing inlays of glass (or, as it might be called, enamel) into glass is as old as ancient Egypt. It is also within the competence of the enameller to inlay enamel with enamel ; and, as was said, something of this sort may have been done in Irish work. Again, in the crown of Rudolf II. in the Treasury at Vienna there is some white enamel with what looks like translucent champlevé upon it. Close examination might reveal a fine gold cloison between the white and colours. If not, the pattern must have been engraved in the white, and the parts dug out filled in with translucent colour. There is also at the Musée des Arts Decoratifs at Paris some eighteenth century trinketry in which are effects to be accounted for only by the supposition that the ground of translucent blue enamel has, after being fired, been minutely engraved and filled in with green and red enamel.

XIX. PAINTING IN TRANSLUCENT COLOURS.

Painted enamel follows a comparatively even course, and there is no longer any occasion to separate the story of its progress from the description of the processes through which it went.

The contention that Limoges was the birthplace of early mediæval enamel is now no longer very staunchly upheld even by the French—the evidence is to the contrary—but it was twice the centre of the enameller's art, and the second time it was not only the focus, but the source, of its revival. That is why it seems to me advisable to reserve the term Limoges for the kinds of enamel which unquestionably did arise in Limoges, and in which the Limousins were supreme.

The new departure was essentially painter's, as distinct from gold or coppersmith's, work. In fact, the metal ground was to this kind of enamel what the wood panel or the canvas upon which it was painted was to an oil picture.

A variation upon the ordinary "Basse taille" method (Chapter XII.) was, not to model the figures, but to engrave lines within the shallow colour troughs, to blacken these (perhaps with niello), and then to fill up with translucent enamel, through which they showed plainly. It was but a step from that to painting black lines instead of engraving and nielloing them ; and that was in fact the next development of enamel. So we arrive

at that first stage of painted enamel where the artist filled in his outline drawing with translucent colour much as a child colours an engraving. This method of drawing the shadows in lines of dark and glazing over them with the transparent local colours was perfected by Nardon Penicaud, who, though not the inventor of the new method (Molinier says it was practised as early as the middle of the fifteenth century, and Nardon was not born till about 1470), certainly carried it to perfection. Both Nardon and Jean Penicaud I. worked in what may still be called the Gothic manner. Nardon's colour has all the richness of stained glass; and there is significance in the fact that the Limoges enamellers of this time were in many cases, if not actually glass painters, brought up in the glass painter's shop.

In the first rude examples of the new manner the painting was perhaps done directly on the copper ground. At the end of the fifteenth century the practice was either (1) to scratch the outline of the design upon the copper and then coat it with colourless glass or enamel—flux, as it is called—upon which the painting was done, or else (2) to trace the design at once in black upon the flux.

In any case the painting began with the black or dark brown outline, which when fired had some effect in stopping the flow of the colours. In so far as it did that, it took the place of metal cloisons. The enamel was possibly stiffer than what was used before, and not so fluid. It was kept from flowing by being put on in layer after layer of thin colour, each of which had in succession to be fired. That, of course, made it also less liable to chip off in the cooling. The colours, for the most part translucent, were then laid on with a spatula. They did not usually melt into a quite flat

tint, and a certain inequality of surface gave them a liquid look which is anything but unpleasing.

Enamellers used by preference translucent colours, eventually underlaying them with gold and silver to enhance their brilliancy. The tints are not all equally translucent; but they probably got them as clear as they could. A sort of old-gold colour which occurs may be either clear, colourless glass, or pale yellow, through which, in either case, the copper shows: it is impossible to say from the look of it which it is. Where only copper colour was to be, a coat of clear glaze, or "flux," had to be used. For want of a good translucent red, they employed an opaque one, which stands up above the rest of the painting just as the fine coral-coloured clay does upon Oriental faïence, and, like it, seems not to belong to the translucent palette.

As early as the fifteenth century a little white began to be used for high lights under the clear colour.

The work which one can still describe as mediæval (that of Nardon Penicaud, Jean Penicaud I., and J. B. Penicaud, all done in the first half of the sixteenth century) was very directly and vigorously, sometimes quite roughly, painted. It has nothing of the smug look of Renaissance work. There are some sixteenth century plaques, too, by Couly Nouailher, which are refreshingly sketchy, quite glass-painter-like in the rude freedom with which the lines are brushed in.

Of course the same care had to be taken with painted as with goldsmith's enamel. The colours that required the greatest heat to fuse them were first fired, then the softer colours, and last of all those that would stand comparatively little heat.

The brilliancy of translucent colour was clearly to be enhanced by underlaying it with brighter metal. Accordingly the practice was to insert between the

ground of flux (to which it adhered) and the colour (which adhered to it) thin foil of gold or silver. This was done at first with some reticence. Nardon Penicaud used "paillons" (as these little bits of foil were called) only as a backing for quite small jewels and so forth; and they sparkle in the borders of his robes like veritable precious stones (89). Perhaps they even fused on little morsels of coloured glass over the gold, just as the glass-painters of the period fused larger jewels of coloured glass on to the crowns and jewelled vestments of the personages depicted in church windows. That, by the way, would account for the ruby colour they got, which might very well be copper ruby glass ground down thin enough to give a paler colour than could well have been got in copper red enamel. There is a recently acquired plaque in the Cluny Museum (collection Wasset) in which a charming and rather exceptional use of "paillons" is made in the foreground flowers.

Foil, however, soon began to be used in great profusion (90); and when in the sixteenth century all the reds, browns, and yellows came to be underlaid with gold, and all the blues, greens, and purples with silver, the glory of the colour got a little gaudy. That, however, was a later development, when painters like Susanne Court and Jean Courteys pitched their colour so high that it ended in being rather shrill.

What might be called a homœopathic remedy for this is to hatch or stipple the colour with gold, which gives it a more lustrous and less tinselly appearance. Touching the high lights with gold paint, just as the shadows were got by lines of black, was the last painting operation. It was fixed by a much more moderate fire than even the softest enamel colours required, probably with a coat of flux over it. This resort to gold for the high lights is reminiscent of the use made of

89. DETAIL OF TRANSLUCENT ENAMEL PAINTING BY NARDON PENICAUD, CIRCA 1500.

the gilt metal in cloisonné and champlevé. The powdered gold was painted on with a pencil, very often in the form of hatching and stippling, as by Nardon Penicaud and his successors, as well as L. Limousin. In portraiture the hair was often traced in fine gold lines, and the background dotted or starred with gold (89).

But there was another way of working the gold. Once applied, it was easy to scrape lines out of it and show the black or colour underneath. This gave, of course, black or coloured lines on gold. Gold lines on black or colour were got by coating the gold (leaf gold in this case probably) with enamel, and scratching through that down to the gold. The needle point gave, it need hardly be said, much finer lines than it was possible to trace with a brush. This sgraffito, or "picking out," as it is also termed, was an old glass-painter's trick: the Swiss window-painters carried it to extraordinary perfection. Leonard Limousin employed it to good effect, and so did Couly Nouailher. I remember a subject of his in which certain figures in the background are, as it were, sketched with the needle point in gold; that is to say, gold shows through where the black has been scratched away. We come also upon sixteenth century portrait heads most perfectly modelled in this way, the needle strokes all slanting from right to left, producing very much the effect of a gold medal.

In flesh painting the enameller had to do with opaque tin white, and it resulted in his using it in a very characteristic way. The parts to be painted were first grounded with dark colour, and on this the modelling was done in body white. Thinly painted, it gave intermediate tints, lighter or darker according to the solidity of the white; and it was possible to get very subtle gradation of tint. Dark lines could be got by scratching through the white down to the ground. This

"pâte-sur-pâte" painting might have to be repeated. If it came out of the fire too dark, it had to be strengthened; if it came out too white and solid, it had to be ground down and polished. But the flesh was always the least satisfactory, as it was the most difficult, part of the business. Nardon Penicaud generally painted upon a black or blackish foundation, and his flesh tints are

90. TRANSLUCENT PAINTED ENAMEL.

uncomfortably cold. Eventually manganese purple was adopted as the general ground tint for flesh, and the grey pink it gives with the white is even less pleasant than the grey which came of working upon black. Manganese, seldom or never pure, proved a treacherous colour in the fire, and probably never came out just as the painter would have chosen had he been its master. A softer effect seems to have been got by

a thin glaze of manganese after the modelling was done. And perhaps touches of white were painted into this again.

The richer the colour the more glaring was the discrepancy between it and the purple pink, cold grey, or staring white of the flesh. In the astonishingly brilliant work of Susanne Court (that of the Courteys is by comparison subdued) the splashes of white flesh always challenge attention from afar. Witness the "Apollo and the Muses" in the Waddesdon collection at the British Museum. This white is so out of focus that one can only suppose that the artist dared not tone it down for fear of dimming the glory of her translucent colour. It would have borne reducing, had she but known it. The wonder is that she and her school did not, seeing how glaringly raw the white was, manage to do better another time. Is it possible they never realised how aggressively the white flesh pushed forward out of their colour compositions?

The difficulty of flesh painting is got over in some medallions in the British Museum (North Italian, *circa* 1480) apparently by painting first of all in grey upon white, and then modelling this grey tint by scratched lines, slanting all one way, through which the white ground shows. The background and draperies are in this case in translucent colour.

Plaques of painted enamel, it will be observed, are usually slightly convex on the surface. There is a practical reason for this. A coat of enamel would, as it contracted in cooling, draw in the edges of a flat sheet of copper and make it curl up, just as a sheet of stout paper pasted on to card will draw it out of the flat as it dries. This danger is anticipated by coating the copper with enamel on the reverse side also, which is always done unless the copper is extraordinarily thick;

but it is well to make security twice sure by having the copper convex to begin with.

Painting upon a modelled surface verges upon incrustation (Chapter XVI.). At times it oversteps

91. EMBOSSED AND PAINTED ENAMEL, SIGNED "J. C."

the line, as in the shield of Charles IX. in the Galerie d'Apollon, in the Louvre, where, by the way, the pinkish flesh colour has for the most part peeled off, as if to suggest what a much more pleasing effect would have resulted from the deliberate adoption of the convention of gold flesh; it goes so much better with bright translucent colour. At its worst, however, white or flesh colour is not quite so harsh on a modelled surface as upon a flat one. In the plaque on page 159, where the figure of Diana and the rock behind her are in relief against the flat painted distance, the embossing may be regarded as only giving relief to the picture. Here it certainly adds richness and quality to the colour; but it has not always that pleasing effect. There is in the Louvre an embossed and painted dish by Jean de Court which rivals the pottery of Palissy in its ugliness.

In the case of very big pieces of enamel, such as the plaques by Pierre Courtois done for the Château de Madrid (1559), there is every excuse for not attempting to make them flat. They are made up, it will be remembered, of a number of parts fitted together into panels some five feet high, the biggest ever done; but, even so, the component pieces are of such size that there would be every likelihood of their buckling in the fire; and a certain amount of embossing, if it does not altogether prevent that, effectually disguises it. These great figures look rather coarsely done where we see them in the Cluny Museum; but, placed at the right distance from the eye, they must have made most effective decoration.

92. VENETIAN ENAMEL OF THE FIFTEENTH OR SIXTEENTH CENTURY.

XX. VENETIAN ENAMEL.

WHAT is known as Venetian enamel may be called translucent incrustation. It is all on the surface of the metal. And in a sense it is painted, though it is in no sense painter's work. So far, indeed, is it removed from the pictorial in treatment that it has never been greatly esteemed by connoisseurs, who assume picture to be the highest form of art. That they may fairly do; but to value art only in so far as it approaches the pictorial, is to judge decorative art by quite a false standard. One would have thought it clear enough to anyone in the least appreciative of enamel that the Venetian work did more justice to the "métier" than the most consummate

93. SO-CALLED "BURGUNDIAN" BEAKER OF TRANSLUCENT ENAMEL IN THE KUNST HISTORISCHES MUSEUM AT VIENNA.

94. FIFTEENTH CENTURY FLEMISH BEAKER IN GRISAILLE.

M 2

95 SIXTEENTH CENTURY SILVER-GILT ENAMELLED SPOON, GERMAN (COMP. 96).

picture painting in grisaille. It suffers in popular estimation for what is a great merit in it, its purely ornamental character.

Venice was in close contact with the East, and there is something about the Venetian design which is almost Persian. In Venetian enamel the copper, usually a vessel of some kind (though there are in the British Museum and in the Gewerbs Museum at Cologne some square plaques or trenchers, curiously alike in design), is generally "gadrooned" or beaten up into bulbous shapes, and then coated with white tin enamel. This is in turn glazed with deep, rich cobalt blue and copper green and manganese purple, always in broad masses of colour, and finally patterned over with feathery gold brushwork and coated with flux. The gold pattern frequently encloses little jewels of turquoise and coral red. This coral red stands up above the ground, just as the Rhodian red does in Persian pottery, and looks as if it were the same clay colour. The gold, though surface work, has very much the effect of damascening. You can see plainly enough in the dish on page 161 the zones of white and colour, and the gold tracery upon them.

It is in such places as the centres of the "palmettes" or spreading leaves there shown, that the drops of coral red are introduced, like jewels.

Persian influence is to be traced again in the so-called "Burgundian" cups of the fifteenth century in the National Museum at Vienna, one of which is illustrated on page 162. The birds and beasts there seem to be the undoubted offspring of the creatures on a Persian carpet.

96. DETAIL OF 95 SHOWING LEAVES AND STEMS OF GILT METAL EMBEDDED IN THE TRANSLUCENT AND OPAQUE WHITE ENAMEL.

There is at Vienna a cup of very similar character, the goblet of Frederick III., which is called Venetian; and it seems very likely that all of this is Venetian workmanship, done perhaps with an eye to Burgundian taste. The cup on page 163, said to be Flemish, has something in common with it, though it is in grisaille and gold.

The "Burgundian" colours are the same as in the Venetian vessels already mentioned, translucent blue, green, and purple, and they are more or less sprinkled with gold. The white, apparently painted *on* the translucent colour, is shaded by way of difference (as may

be seen in the animals) with little dots of black, "poinctillé," as a Frenchman would call it. On the base of the cup is some amber colour, not, so far as I know, to be found in Venetian enamel. The little flowers, stars, crescents, and rays of gold or gilt foil, which have been embedded in the enamel ground and rise slightly above its surface, form a distinctive feature in the work. The Burgundian cups are of the fifteenth century; the more ornamental "Venetian" work is of the sixteenth at earliest; and the painting in gold upon this last is probably only a cheaper way of getting the effect of foil. Brushwork allows, of course, a much freer and more effective use of gold.

The relation of the Burgundian method to cloisonné is shown in a fifteenth century spoon in the Victoria and Albert Museum (95, 96), which is said to be of German workmanship. We find in it again transparent green and purple and opaque white grounds, with silver gilt ornament embedded in it, the leaves chased in delicate relief, the stalk patterned, and the ground under the clear enamel tooled to give brilliancy to the colour. The wonder is, perhaps, that this kind of work has not been carried further, especially when it is remembered how cloisons were, even in old work, sometimes not soldered to the metal, but kept in place by the fused enamel.

In Hungarian wire enamel of the sixteenth century or later, we come upon small discs of foil which have been driven into the colour until one seems to see, in the concave face of these little dots of gold, the impression of the rounded end of the implement employed in pressing them into place.

97. SALT CELLAR IN GRISAILLE, BY PIERRE REYMOND.

XXI. PAINTING IN GRISAILLE.

About the end of the first quarter of the sixteenth century enamel-painting in grisaille came into fashion. So far as concerned technique, it was simply a carrying further of the method adopted from the first for flesh painting, except that the body-white was ordinarily painted on to black instead of manganese purple.

The process was this: the copper was first coated with black, let us say, and fired. Upon that was laid a very thin film of white, reducing it to dark grey. This, before it was fired, formed a good surface on which to sketch or transfer the outline of a design. That done, the outline was scratched down to the black, and the coating of white was rubbed away, dusted off with a brush, or otherwise removed from the background and from any other portions of the design which were to appear in the full strength of the black. When this was fired, the artist had, as it were, the ghost of his picture. To "materialise" it he had only to go on painting in white, thinly for the darker tints, more solidly for the lighter, gradually piling it up until it was quite thick where he wanted pure white. The safe practice was, however, not to put on too much enamel at once, but to get solidity by successive paintings, each of which had to be fired.

The process is exactly analogous to the "pâte-sur-pâte" of the china painter, who, indeed, derived his inspiration from Limoges enamel. A competent painter can get by means of it a certain amount of actual relief, for the high lights are raised appreciably above the level of the dark ground. It is said that in the seventeenth century china clay was sometimes mixed with the enamel to give it relief; but tin enamel would do all that was required in that direction, and the only advantage in using china clay, assuming that it would adhere sufficiently, would be its greater translucency. An enameller might very possibly experiment with china clay, as he would with any other likely substance that came in his way.

Tin enamel is thick and heavy and difficult to work, and has to be manipulated in a different way from any other kind of pigment used by painters. It is usually dropped on from the point of a brush, and the drops, adroitly placed, are afterwards worked together, blended and softened off with spatula, needle point, brush, or whatever it may be. But all this while the volatile oil, which is the medium employed, is evaporating fast; and the work has to be done quickly, before the white sets, so that it takes a very prompt, slick workman to make sure of his effect.

The process of scraping out, referred to in describing the initial stages of the work (you can see the scratched line plainly in the portrait opposite), was employed to considerable purpose by the early painters, who seem to have felt this to be a more sportsmanlike way of getting lines of dark than by painting them on the white in black. Having got a grey tint, they would scrape down to that again just as they did to the black. To what extent grisaille painters may have departed from the method of pure "pâte-sur-pâte," that is to say of

putting on layer after layer of white and scraping or rubbing down to the dark, it is of no use pretending to say. Similar effects are to be got by different means. The white enamel might be wiped off in a wet state instead

98. PORTRAIT HEAD, SHOWING BLACK LINES SCRAPED OUT OF THE WHITE ENAMEL.

of being erased when it was dry, and who could tell? The liquid effects of "pâte-sur-pâte" on porcelain are got, as M. Solon tells us, partly by engraving or cutting down the white porcelain until it is thin enough to let the dark ground show through. If an enameller got

99. GRISAILLE BY PIERRE COURTEYS.

his white too solid, there was nothing for it but to polish it down; and men may, for all we know, sometimes have relied upon the possibility of doing that, and painted heavily with a view to polishing down afterwards. Working on the hard enamel, they could see at least what they were doing, and had no longer to reckon with the fire.

Although grisaille is thus in theory a process of painting in white upon black, it seldom stopped at that in practice. It can hardly be said that enamellers did not play the game; they were at liberty to choose their own game, and to make rules of their own; but they played a game less strict than pure "pâte-sur-pâte" painting. There were very few of them who did not finish with shading in lines or hatchings of black upon the white. It was the obvious and only way of making good whatever had gone wrong in the fire, and something generally did go wrong.

An artist of any individuality would naturally work out for himself a manner which was not quite that of everybody else; and there is a very noticeable difference in the handling of the various grisaille painters. Some, like Leonard Limousin, paint with freedom.

They knew what to do, and how to do it; and could afford to leave their work spontaneous and fresh. The work of some is hard, that of others exceedingly smooth and soft, as, for example, the painting of Penicaud II., who makes little use of line, even when working upon a fairly large scale. Luthmer says he used a grey instead of a black under-painting, and he certainly seems to have painted in grey upon white sometimes. Pierre Reymond also painted in grey on grey, with admirable results, not of course appreciable in a line drawing like that at the head of this chapter (97). The use made of the scratched line depended upon the painter, partly upon his temperament perhaps, partly upon his skill, though it was more commonly

100. CUP IN GRISAILLE, BY CONTY NOUAILHER.

employed in early than in later work. It did not lend itself very well to the rather smug finish at which grisaille painters eventually aimed.

The earlier painters seem to have got at least their broader outlines by scraping down to the ground. So did Leonard Limousin, who would define the main folds of his drapery by that means, and at times go so far as to outline the features of the face, the eyes even, in the same way. Pierre Reymond, the Courteys, and others made at times liberal use of the needle, scratching out not only outlines, but fine hatchings. These, if they proved aggressive, as they were apt to do, were toned down with a film of white, which gave very much the effect of scraping down to a grey tint. In the result the two processes are barely distinguishable one from the other. Failing such after-treatment, fine lines and hatchings with the point have too much the effect of penwork to go well with the more tender modelling built up in white.

The final painting in metallic gold served various purposes: to heighten the modelling, as had been done already in coloured work; to define the outline where the shading was so dark that it would otherwise have been lost in the background; to represent filigree embroidery upon costume; to dot or otherwise diaper a background; to outline ornament; or to trace arabesque or Arab-like patterns upon the borders and the backs of dishes. Pierre Reymond made admirable and graceful use of this ornament freely painted in gold upon the black.

The notion, which also Pierre Reymond is supposed to have started, of entirely coating copper vessels with tin enamel and painting them, whether in grisaille or colour (100), was not a very happy one. The resulting forms have the character neither of pottery, nor of

101. PLAQUE IN MONOCHROME, BY L. LIMOUSIN, IN THE WADDESDON COLLECTION AT THE BRITISH MUSEUM.

metal-work, nor of some new thing. Personally, I always feel to want acknowledgment of the metal base, if only at the rims; and it is just there that the enamel is often broken away, giving the thing a shabby look, and showing the practical necessity of bringing the metal to the surface at such places.

Enamel pictures in black and white are seldom altogether satisfactory. There is an inky quality about them, and a sort of chilliness. No one with a sense of colour, and especially of vitreous colour, will think their draughtsmanlike qualities—and they are considerable—sufficient compensation for the loss of what is after all best and most beautiful in enamel. Leonard Limousin was more than justified in preferring to paint upon a deep rich blue ground instead of a black: the Neptune panel (page 173) is painted all in shades of blue. Pierre Reymond also had a liking for a blue reduced by white to about the colour of a Chinese "hawthorn" pot. Quite the most beautiful effects of pure monochrome painting are upon a dark ground, usually a blue one.

The Italians painted sometimes in grisaille upon a ground of translucent cobalt over silver, but in stipple, not "pâte-sur-pâte." The term grisaille is commonly, though not strictly, used to describe monochrome painting in blue or green; but it is, of course, the painting in black and white, with the resultant grey, which gives grisaille its name. Whatever the colour of the ground, the process of building up the design upon it in body white is the same.

One cannot help wondering how the fashion of grisaille ever came about. Probably it was more or less a reaction against the excessive richness of much of the work in translucent colours. No doubt the use of tinsel was abused. Apparently it was beyond the

enamellers' power to reconcile the opaque colour they were obliged to use in flesh painting with the translucent colours employed in the rest of the work; and one way out of the difficulty was to abandon colour and paint entirely in black and white.

102. GRISAILLE ORNAMENT OF THE SEVENTEENTH CENTURY.

The art seems also to have got into the hands of men who were primarily draughtsmen, to whom colour was a lesser consideration than form; and grisaille gave scope for draughtsmanship. Then, again, what better means could there be of reproducing engravings after German and Italian masters? And few of the great

Limousins, except Penicaud III., depended much upon their own invention.

Whatever way it came about, there can be no doubt painting in grisaille was a departure from the one direction in which enamel promises the most brilliant results; and in departing from it enamellers put themselves at a disadvantage.

Even a French apologist for this French art (Claudius Popelin) vaunts only the admirable rendering of the designs of Raffaelle and the rest, and makes no claim for any quality in their work peculiar to, or characteristic of, enamel; and one feels always that they were rather skilful copyists in a difficult medium than artists making much of the possibilities of the particular craft they followed. Ornamental design, without figure work (102), seldom occurs in grisaille.

Strange to say, this change of fashion is supposed by many to be in the direction of higher art. It is, of course, only in the direction of more pictorial art, by no means the same thing. And, unfortunately for grisaille, the qualities of a picture are the very last to be obtained in enamel. It was a case of dropping the bone for the shadow.

103. TINTED GRISAILLE, BY LEONARD LIMOUSIN.

XXII. TINTED GRISAILLE.

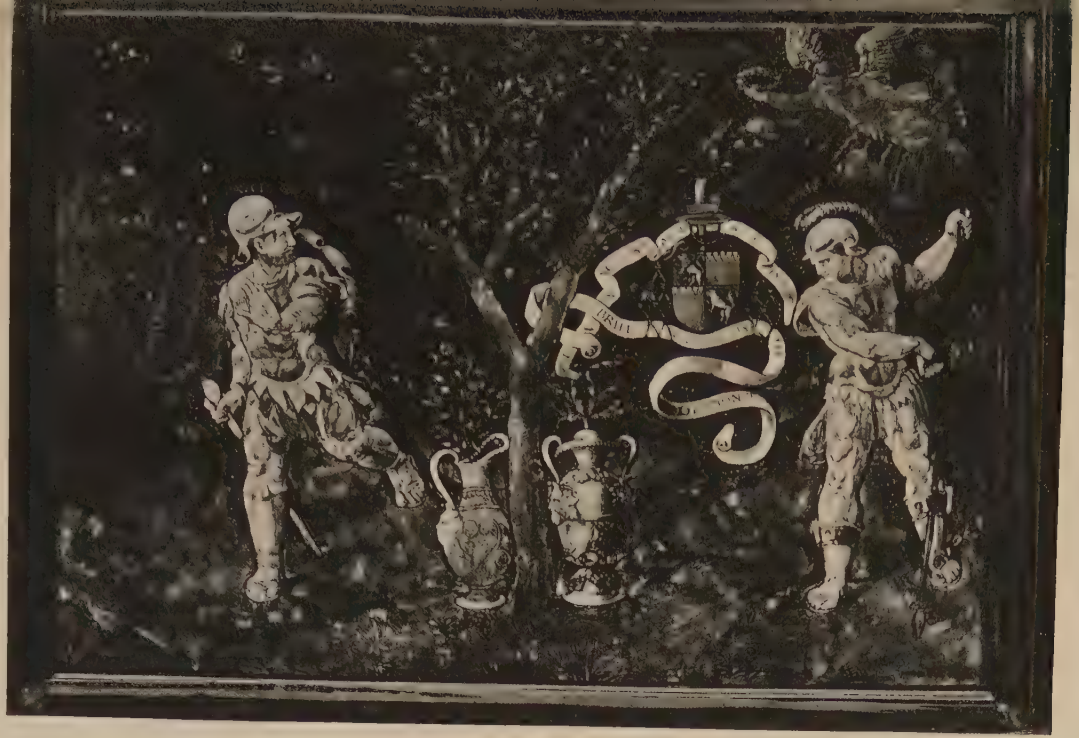
THE fashion of grisaille did not appeal equally to all the enamel painters of the sixteenth century. Some of them had a feeling for colour not to be kept altogether in abeyance by the mode. Many of them, and those of the best—Jean Penicaud, for example, Pierre Reymond, Leonard Limousin (103)—found relief from black and white in what may be described as "painted grisaille." That is to say, on a foundation of grisaille they painted in colours for the most part translucent. Work of this kind bridges in a way the gap between grisaille and painting in translucent colour directly upon copper or over gold and silver foil. It looks very often as if, impatient with grisaille, they had taken to tinting it. And that is possibly how it came about ; but there is some coloured work which suggests another possibility. It is conceivable that grisaille itself was in the first instance

no more than a means to an end, that it was adopted only as a groundwork for painting in coloured glazes; and that, having reached the stage of modelling in black and white, they were so pleased with the result that they abandoned the idea of colour, and perfected the new "genre." I once commissioned a painter to execute for me some panels in red, and he brought them to me in black and white, explaining, when I remonstrated with him, that he had meant to get the colour by glazing, but that he had so delighted himself with the effect in black and white that he could not find it in his heart to spoil it.

At all events, side by side with pure grisaille there was carried on a practice of tinted grisaille, in which the design was first painted in white on black or some dark colour, then glazed with translucent colour, and finally perhaps touched up with white again in the high lights. It was a common thing to paint ornament frankly in black and white and then glaze it in parts with turquoise, copper green, and manganese; and the same thing occurred in figure painting, as, for example, in a plaque in the British Museum signed P. R. 1541, in which a shepherd and his sheep are in grisaille, but the grass is delicately tinted in green, the water in turquoise, the sky in grey blue, a lion in pale yellow, and the roof of a house in the pale red of the flesh.

Very delicate and pretty effects were produced by tinting grisaille. But it seems to be a condition of success that any shading in grey should be light and sparingly employed, so that the colours remain for the most part fresh and pure.

In the panel by Jean Penicaud II. (opposite), the modelling in grisaille under the tints is carried rather too far. In the Cupid and Psyche panel after



104 TINTED GRISAILLE BY JEAN PENICAUD II., NOW IN THE SALTING COLLECTION.

Raffaelle (page 177), the modelling is got by painting upon very faint grisaille, and there, too, some of the colour is opaque.

Again, in the famous Apostle figures at Chartres (105) the modelling is almost entirely in green, blue, purple, salmon, golden brown, or whatever the local colour of the draperies. They are on a white ground; but the same thing occurs in painted grisaille figures upon a dark one. An exceptional way of going to work, shown in a little sixteenth century plaque in the Galerie d' Apollon, was to pencil in the figures in brown upon white, and slightly to tint them in parts with grey blue, turquoise, flesh colour, and manganese purple. Franks mentions some Flemish-looking enamel upon a brown ground painted in white, glazed with translucent colour, and heightened with gold.

Deeper tinting also occurs (in the work, for example, of Jean Penicaud II.), in which the draperies are not only, as it were, washed over with a colour, but shaded with a deeper tint of the same or some other colour, such as green upon yellow.

Another, and very satisfactory, method, employed, for example, by Pierre Courteys, was not so much to shade white with colour as to glaze it with colour and paint white into or on to that. The shells, for example, in the border of the little saucer on page 182, are glazed with translucent turquoise and purple into which touches of white are introduced. The brilliant blue and green grounds employed in portraiture were painted on a foundation of white.

Of all those who painted more or less in grisaille Pierre Reymond distinguishes himself as the one especially gifted with the colour sense.

No one painted more boldly and directly than Leonard Limousin, when he had not to get a likeness;

105. PAINTED PLAQUE BY LEONARD LIMOUSIN, NOW IN THE CHURCH OF S. PIERRE AT CHARTRES.

and his colour was as juicy as could be wished. Leonard's is a great name, none the less known that he often signed it: in one case he introduces into his composition a little label with the advertisement of his qualifications, " Enameller and Painter to the

106. SHELL ORNAMENT PAINTED IN WHITE AND GLAZED WITH TRANSLUCENT COLOURS, FITZHENRY COLLECTION.

Chamber of the King " ; but there is no mistake he was really a consummate artist.

It was a very happy thought to paint delicate arabesque in white upon a translucent copper green ground and to shade it with the same. The contrast between the fresh green ornament and the relatively

107. PORTRAIT BY LEONARD LIMOUSIN.

olive tint which the metal, shining through, gives to the ground, is most harmonious; and a filigree pattern in gold upon the ground enhances the effect.

The first use of colour over white was as a flesh tint —and no wonder, when we see how unsatisfactory was the flesh tint got by painting in white on manganese.

It was with flesh tint also that enamel began in glass painting; and it was the same iron-red (we call it also "china red") which was used in both cases. There is no possibility of confounding it with manganese. That was cold and purplish, this inclines, if anything, to orange; that looked like white dropped moist upon the ground colour, this lies evidently on the surface of the white, and has the dry look of red chalk. It is not the colour of flesh, though they may have thought to get flesh colour that way; but as a means of draughtsmanship, by which to get delicate detail and accuracy of modelling, the attraction of it was quite irresistible to the portrait painter. Leonard Limousin used it constantly (page 183), though I fancy he sometimes mixed white with it. The surface got by hatching, stippling, and delicate line work was, however, so different from that of the more liquid-looking colour that the result is not absolute unity of effect. Apart from this dry china red, we come occasionally upon a transparent pink glaze which cannot well be manganese, though in some of Pierre Reymond's work, where the cool blue tone of the painting generally may conceivably have, as it were, taken some of the purple out of it, it might possibly be that. The flesh tint over delicate grisaille in Leonard Limousin's Apostle plaques at Chartres (105) cannot be explained in that way. Mr. Cunynghame speaks of a glaze of gold pink used by J. Penicaud III. That might have given it. Is it possible that Leonard learnt the secret of gold red from Cellini?

I wonder whether others have been struck, as I have more than once, with the resemblance in colour between painted grisaille and Italian majolica. It is in a brighter key; but the family likeness is strong.

XXIII. ON-ENAMEL PAINTING.

THERE is a distinction to be drawn between enamel and merely *on-enamel*, or, as a potter would say, "on-glaze" colour. It may be only a difference in the degree to which the colouring matter is made one with the glaze, but in effect it amounts to the difference between a metallic oxide dissolved in glass and an oxide which is only mixed with it. There is all the difference between painting *in* enamel and painting *on* it.

There is a certain school of enamellers whose colour has more in common with the ordinary on-glaze pigment used in pottery painting than with the coloured glass which constitutes enamel. It is, in fact, precisely what was used in painting upon porcelain, and the only difference between it and painted faïence is that in one case the tin enamel is upon metal, and in the other upon clay.

Enamel at its best and brightest is neither on the glaze nor under the glaze, but in it, held in solution. It has a luscious, juicy quality compared to which on-glaze or on-enamel colour is hard and dry, though in the case of a very fusible colour upon a soft vitreous surface it may, if sufficiently fired, sink in and be held more or less in suspension.

On-enamel colour was used by Leonard Limousin, if not before his time, but at first only by way of exception—not so much, perhaps, to give the tone of flesh (though it gave a much more pleasing flesh tint than manganese) as to enable the painter to model his

flesh with a certainty which the "pâte-sur-pâte" process did not allow. At first, and for a long while, it was used, apart from flesh, only to force the shadows and to mend faults in modelling. It was a way of "faking," and was regarded as such. A coat of flux laid over it dissembled its use. The masters of "pâte-sur-pâte" had no great occasion to resort to it, and they used it sparingly. The more extended use of it, and especially the habit of dependence upon it for colour, was a distinct departure from the older and more difficult proceeding, and marks the beginning of a downward course. "'Twas ever thus!" The practice called in to help out a method ousts it in the end.

Eventually enamel, such as it was, fell into the hands of the porcelain painters, and might have been practised in any porcelain factory. Very likely it was. It was practised certainly not only in the neighbourhood of Paris, but at Dresden, at Battersea, and at Liverpool, where there were china works. There are plenty of seventeenth and eighteenth century enamelled copper vessels made in Germany which are very like porcelain, and were no doubt made in imitation of it. The pretence implies, of course, a white ground.

Whether the design is upon a white or a dark ground makes theoretically no difference; the same process may be employed in either case. But practically it does make a difference. In the case of a dark ground it is more convenient to paint in body colour, and accordingly it was the dark ground which led to "pâte-sur-pâte" painting. It is not surprising that the adoption of a white ground, more or less in imitation of porcelain, led to a method of workmanship more like china painting, and differing from grisaille or other Limoges enamel much as transparent water-colour differs from body colour. It ended in miniature painting, and was

practised by men who painted precisely the same kind of portraits upon enamel as they had painted upon ivory. Somewhere about the year 1632 Jean Toutin is supposed to have made the new departure of painting on watch-cases and such small goldsmith's work in colours upon a white ground. His published designs, however, show ornament in white on black.

At the head of the miniaturists stands Petitot (1606—1691). Born at Geneva, he began by painting ornament, with which he decorated snuffboxes, watch-cases, and the like; and it is just possible that the starting-point of his art may have been the local industry of clock and watch dial painting. The foundation of his miniatures was sometimes copper, more often gold, overlaid with tin enamel, upon which he painted in china-painter's colours. It was Petitot who by his masterly execution gave a certain prestige to seventeenth century "on-enamel" work; but the renown was due entirely to the miniature painter, not to the enameller. He adopted the vitreous medium, we may be sure, not out of any sympathy with it, but because it promised permanence. Still he made himself a master of it, in so far as it served his purpose of portraiture.

Between the years 1753 and 1775 enamel painting was practised at Battersea, where it was introduced by a Huguenot, Janssen. The work done there was hard and chalky in colour, and took entirely the pictorial direction. It never rose above manufacture, and it descended even to transfer printing, which became about this time a trade practice in pottery decoration.

Nothing ever done at Battersea will compare for a moment with French work, any more than Chelsea china compares with Sevres. There is a snuffbox in the Wallace collection in which the radiating divisions

of a cockleshell pattern, outlined in raised gold, are most exquisitely painted with minute peacocks' feathers in green, red, black, and yellow. That rather trivial sort of thing may not be particularly worth doing, but it could hardly be done better than it was by the French in the days of Louis XV.

The seventeenth century method was not at the best a promising one for colour decoration, but there is plenty of work of a rather earlier date which suggests to what much better purpose the Battersea painters and others might have employed it.

In Hungarian work, for example, of the sixteenth and seventeenth centuries, ornamental devices were traced in colours upon white with very pretty effect; or floral patterns, delicately outlined in black, covered the ground so closely that, though the interstices were filled in with the outline pigment, the black hardly counted as background; and when the leaves and flowers were in colour veined with black (white flowers were veined with red or other colour) the result was very rich. More naturalistic flower painting, even that which was done at the end of the sixteenth century, was never really very good.

The best painted work on white was the Chinese. The painted enamels of Canton (Canton being the place where porcelain, brought, according to Dr. Bushell, overland in the white from Ching-tê-chên, was enamelled in colours) are executed precisely in the manner of porcelain painting; and they are so like it in pattern, too, that there can be little doubt they were the work of the very men who painted the porcelain known to collectors as belonging to the "famille rose" or "famille verte." The saucer opposite (108) might, except for the quality of its tin enamel ground, be "famille rose" porcelain; the four-sided one on page 191,

in brown upon white with a gold outline, is, on the other hand, reminiscent rather of lacquer than of porcelain.

There is in the British Museum a curious Chinese box in which the bronze is first fretted and then coated with white; on this the design is outlined in

108. CANTON ENAMEL, CIRCA 1700.

black, and filled in with pale translucent colours. The richest painted work of the Chinese is where none of the white is allowed to come to the surface. There is a good example of this at the British Museum, a boot-shaped bowl brought from Thibet, with what is called a "brocade" pattern in cobalt blue upon

turquoise. This is unmistakably in imitation of cloisonné, for the ornament has, or had, a painted outline in gold, now for the most part worn away.

The truth is, Canton enamels were in the main only a base imitation of porcelain, and it was as such the Chinese themselves esteemed them.

As a substitute for semi-translucent porcelain tin enamel was at the best a very poor thing. No wonder that, by the end of the eighteenth century, the use of so inadequate a makeshift died out, not to be revived until our own day for the purposes of export. It was good enough for "foreign devils"!

The Chinese were, for all that, most skilful workmen, and brought to enamel painting all their experience in porcelain. It is said that Limoges enamels were sent to China in the time of Louis XIV. to be copied, just as we sent out heraldic designs to be painted on dessert services. India, Persia, and other parts of West and South Asia were also, it seems, supplied by China.

As upon porcelain, so upon enamel, the Chinese employed a much more highly vitrified colour than was used in Europe. It stood up in glassy relief upon the ground. The above-mentioned objections to on-enamel colour do not apply to the productions of Canton.

Some Persian work which has every appearance of merely painted enamel is not simply that. Shallow troughs have been chased down for the tin enamel, leaving fine gold cloison-like lines between, roughly following the forms of the ornament. The purpose of the dividing metal is only to key the white, and the lines are not noticeable until you examine the work. It is quite a usual thing in Persian work to introduce little champlevé or chased panels of tin-white painted with ornament in colour (page 127). I have seen, too, in Persian work little alternating panels of

red, blue, green, or other colour, with ornament in white upon them apparently picked out of it. Another interesting Persian device is to paint gay-coloured floral ornament on white delicately outlined with red, which upon blue and green gives practically a black out-

109. CANTON ENAMEL, NINETEENTH CENTURY.

line. Here again we have hints of the kind of thing which might have been done at Battersea and elsewhere, if eighteenth century taste had not been set upon more pictorial projects. It was not so much for want of technical mastery over their materials as for lack of sympathy with enamel and right understanding

of the possibilities that lay in it that European on-glaze painters lost hold of the mastery of enamel colour. The effects they aimed at were only to be got in comparatively dry colour; and the liquid, juicy, vitreous enamel colours, which fulfilled all the desire of Orientals, to whom decoration meant something, would not have served the Western pictorial purpose. Decorative art is likeliest to achieve something when the artist starts from the full knowledge and appreciation of what his means allow. When he sets out to do something that would be better done in some other medium, the utmost he attains is second best—more likely it is failure altogether.

XXIV. THE PALETTE OF THE ENAMELLER.

The chemistry of enamel colours has been duly expounded by trustworthy experts, by none more helpfully than by Mr. H. H. Cunynghame, a writer not only determined to test the truth of statements commonly taken on trust, but thoroughly competent to do so. Fortunately, too, as an amateur, he was under no temptation of withholding from craftsmen generally secrets which some workmen would still guard with a jealousy belonging rather to trade than to artistic practice.

The scientific aspect of the subject is almost beyond the scope of this volume, and would be entirely so were it not that, apart from the necessity of knowing something about enamel colours if you wish at all to understand their behaviour under fire, it is difficult to discuss enamel colour, even from the artistic standpoint, without reference to its chemistry. It is not easy to express in words the quality of a particular red or blue; but an enameller understands at once, and with barely a chance of misconception, when you describe it as iron, copper, or cobalt. Some short survey, therefore, of the bases of enamel colours is not to be avoided even in a book about art and workmanship.

Enamel is glass. This the enameller uses in the form of a paste made of powdered coloured glass. The operation of the fire at once fuses the enamel

into its cell or on to its ground and brings out the colour, together with such translucency as it may possess.

The colour of glass is due to some metallic oxide; but the quality of the colour was partly due in ancient times to the accident of some impurity either in the glass itself or in the colouring matter. The inevitable trace of iron in the soda or potash, which was an ingredient in it, gave to old glass the greenish or yellowish tint it was the constant aim of glassmakers to get rid of, with very incomplete success until lead was used in quantities sufficient to produce what is known as "flint glass."

A slight tint in the body of the glass would barely affect, it is true, the colour of the deeper, richer, and more powerful tones. But in their case the colour was further qualified by impurities natural to the oxide employed to stain the glass, and not separable from it by any then used process of refining. The modicum of manganese found in cobalt gave it a purpler tinge than pure oxide of cobalt would have; the iron in manganese gave the purple produced by it a brownish cast.

The action of various metallic oxides upon glass is different. Certain of them stain or dye the glass without affecting its translucency; others entirely destroy that quality, and give an opaque body-colour. The addition also of antimony or tin, either of which gives in itself a white, will cloud any coloured glass to which it is added, as cream clouds strawberry juice. The enameller may, in fact, use tin, as the water-colour painter uses Chinese white, to deaden his transparent colour and give it "body."

Absolutely different colours may be obtained from the same metal according to the nature of the oxide,

the character of the glass, and the heat to which it is subjected. Out of copper we get ruby red, emerald green, and, with a soda base, turquoise blue; out of iron sealing-wax or coral red, sea-green, and brownish yellow; out of chromium a heavy opaque green; out of cobalt all the blues except turquoise. Manganese gives purple; gold a paler, colder, and rosier red than copper; silver a clear yellow, and antimoniate of lead an opaque one.

The above mentioned, together with tin and antimony for white, made up practically the palette of the enameller until quite modern times. Recent additions to it are yellows from uranium and selenium, and grey and black from iridium. The black used in the old work seems to have been produced by a mixture of colours, more or less the scrapings of the palette.

Innumerable shades of colour occur in enamel; subtle mixtures will give all manner of tints—not to be depended upon, of course—and there is no saying what may not be got by accident; but it is safe to assert that they are all got out of the palette here given. When a result is producible in different ways it would be rash to say by which of them it was actually brought about; but, though it is often said that this or that is a secret of the ancients, there is little or nothing in the old colour which is not to be explained, and reproduced, by modern chemistry.

The mixing of two or more enamel colours is not such a simple thing as might be supposed. No experience in oil or water-colour painting will prepare an artist for the startling changes which take place in the fire. How should he possibly foresee that copper green and manganese purple will together give him a subdued yellow, or cobalt blue and uranium orange an indigo colour? Given, however, some slight scientific

knowledge, there is nothing so wonderful in the chemical changes which occur.

Enamels of different colours require a different degree of heat properly to fuse and develop them. That is to say, some will not endure the heat that others demand. The harder enamels, as they are called, have therefore to be fired first, then the colours which will bear less, and so on until the softest of all (gold ruby, as it happens) is subjected to a very slight fire. Subsequent firings at a lower temperature need not injuriously affect colours already burnt in.

Seeing that it may be necessary, in order to get the necessary depth or substance, to lay on coat after coat of the same colour, firing it again after each layer, some twenty or more successive firings may be necessary before a complicated piece of work is perfected.

There is always a risk, however, in submitting enamel to the heat of the kiln, never quite under control; and the discretion, which is in art so much the better part of valour, has counselled a reticence in the matter of colour which is seldom without its artistic justification. The success of a colour scheme is by no means in proportion to the variety of colours in it, though artists are tempted naturally, but far too readily, to try for the whole range of the possible palette.

With the exception of a couple of yellows from uranium and selenium and a black from iridium, the colours in the palette given opposite were all used by the old enamellers, most of them from early days.

A fuller palette of opaque colours is made up by the addition of tin to the translucent ones; a touch of tin, for example, gives to translucent turquoise the milkiness of the actual stone. Sometimes, however, it destroys the beauty of the colour; nothing could be much more unpleasant than the tint resulting from the

PALETTE OF ENAMEL COLOURS.

TRANSLUCENT COLOURS.

Blue,	*sapphire* ...	Cobalt.
,,	*turquoise* ...	Copper—with a soda base.
Green,	*emerald* ...	Copper.
,,	*fresh* ...	Iron.
,,	*brownish* ...	Impure iron.
Red,	*ruby* ...	Copper protoxide.
,,	,, (*Jaipur*)	Iron and a little copper.
,,	*cold ruby or rose-pink*	Gold and tin — so-called "Purple of Cassius."
Yellow,	*pale*	Silver.
,,	*brownish* ...	Iron.
,,	*orange* ...	Uranium (*modern*).
,,	*amber* ...	Selenium (*modern*).
Purple	... ...	Pure manganese.
,,	*brownish* ...	Manganese and iron.
,,	*bluish* ...	Manganese and cobalt.
Black	... ...	A mixture of colours.
,,	... ...	Iridium (*modern*).

OPAQUE COLOURS.

Green,	*dense, heavy*...	Chromium.
Red,	*coral* ...	Iron.
,,	*sealing-wax*...	,,
,,	*brownish* ...	,,
,,	"*sang-de-bœuf*"	Copper.
Yellow,	*Naples* ...	Antimoniate of lead.
,,	*orange* ...	Antimony and iron.
White	... ...	Oxide of tin.
,,	*ivory* ...	Antimony.

mixture of tin and manganese. Shades of colour intermediate between those mentioned may be obtained by mixing one with the other; green may be made bluer or yellower by the addition of blue or yellow; but there is always to be taken into account the chemical action of one upon the other, which the fire may set up.

The minerals employed are less in number than the colours produced from them. Cobalt is, with one exception, the base of all the blues used in enamelling. It is found naturally alloyed with iron, arsenic, and copper. Iron gives it the grey or blackish cast we see sometimes in Persian faïence, manganese a purple hue. At its purest it gives a deep translucent sapphire colour. A touch of tin changes it to opaque lapis blue. It may be lightened by the addition of more tin to a pale grey blue, which inclines very often to lilac. The exception above-mentioned is copper, which gives a turquoise blue, but only with a base of soda.

Copper is also the source of the purest translucent emerald colour. A browner shade is produced from iron; but that is because of the impurity of the oxide. In its pure state it gives a green only less fresh than copper. Oxide of chromium gives a rather raw and very opaque green of strongly marked character; there is no denser colour in the enameller's palette.

Protoxide of copper gives also a fine translucent ruby red. A paler, colder and rosier ruby, sometimes called "Purple of Cassius," is a preparation of gold and tin. The addition of chloride of silver warms it. An excess of tin brings it to an opaque purplish pink. Iron yellow with a little copper in it is the colouring matter of the famous Jaipur ruby red.

Suboxide of copper, used in greater quantity than in translucent ruby, gives an opaque red, very much the colour of the Chinese pottery glaze known as

"sang-de-bœuf." Oxide of iron gives an opaque red sometimes approaching to this in colour, but more inclined to orange. It is brighter or lower in tone according to the fineness of its division and the heat to which it is subjected; and it varies from sealing-wax red to, on the one side, chocolate, and on the other coral—the colour, in fact, of the Rhodian pottery red. It might be the very "Armenian bole" the Eastern potters used, except that the clay is possibly too refractory to blend with soft enamels.

Chloride of silver produces a pale translucent topaz. yellow, to which the addition of arsenic gives an opalescent quality. It is perhaps by the addition of tin to chloride of silver that the opaque lemon yellow of the Chinese is produced. A darker translucent topaz is derived from oxide of iron; and the addition to it of copper and manganese brings it to what is called "old gold." An opaque variety of this last-mentioned shade, as well as a yolk-of-egg colour, may be got from iron oxide and antimony with a flux rich in lead. The pale opaque tint we call Naples yellow comes from antimoniate of lead.

Peroxide of manganese in its pure state gives a beautiful purple; but it is seldom or never found pure, and the process of purifying it by precipitation is modern. We owe to the iron, from which it is seldom free, the beautiful purple brown so frequently met with. A bluish shade of purple is due to a trace of cobalt found with it or added to it. Cobalt itself with plentiful addition of tin will produce pale shades of mauve or lavender.

Oxide of tin gives a dense white, antimony an ivory white. Manganese with cobalt and iron, or with cobalt and copper, or with plenty of cobalt alone, will give black. No doubt the scrapings of the palette were used for this purpose.

There is not much room for doubt as to the colours that were used in old enamel. As to the composition of any particular colour, it is not possible to be so certain. Much depends always upon the vitreous body of the enamel; any difference in the ingredients of that may result in quite a different colour from absolutely the same colouring matter. One may feel pretty sure how a tint was arrived at; but, the more a man knows about the chemistry of the subject, the less he will be disposed to commit himself to the definite statement that, in a given instance, this or that colour is actually due to the use of this or that metallic oxide.

Enamel colour, being determined by the conditions of enamelling, has a character of its own. So much is this so that one gets to know what to expect, and to expect it very confidently. A quite unexpected colour in the background of a certain piece of enamel which once perplexed me very much, turned out to be only painted wooden ground appearing through fretted interstices in the goldsmith's work.

110. PERSIAN PIPE-HEAD WITH DROPS OF ENAMEL COLOUR IN IMITATION OF CORAL AND TURQUOISES.

XXV. CHANGES IN THE PALETTE.

It has already been seen (page 55) how in the beginning enamel colour was chiefly in imitation of precious stones. In quite modern times we come upon pearls of white and beads of turquoise blue and coral red, as in Hungarian jewellery and in the Persian pipe head above, where the little blobs of pink and pale blue, in their gilded setting, make no secret of what they represent.

Apart from simulation, jewels have influenced enamel colour. In Hungary they constantly use garnet-coloured purple to go with actual garnets, and everywhere the brighter colours of more precious rubies, sapphires, and emeralds are employed, if not to match the stones to harmonise with them, or if not that to serve as a foil to them.

Indeed, it is quite a common thing for the key of the enameller's colour composition to be set by the more or less precious stones in use, and especially by those in vogue. The element of taste comes also into consideration, especially in the discreet use of black and white and

III. CHAIN ENAMELLED IN BLACK AND WHITE, NATIONAL MUSEUM, BUDA-PESTH.

pale grey in Renaissance jewellery, and to some extent the element of symbolism, as in the marked preference for black and white shown in Spanish and other work of the seventeenth century (111).

But there were also very practical considerations at work in the determination of the colours the enameller should use; and, though in early days it may have been always the desire to get something like coral, turquoise, lapis, ruby, sapphire, or emerald, which was the incentive to experiment in colour, it was the available colour, the colour easy to get and easy to work, which would be the one most commonly employed.

The palette was, so to speak, passed on. Additions to it were rare, and made at long intervals. It was centuries before gold purple was discovered, and then a century or two before chrome green came into use. Eventually enamellers used everywhere much the same colours. Uranium and selenium for yellow and iridium for black, are discoveries of our own day. With chemists annually introducing to us new elements, there seems some danger now of an embarrassment of colour riches.

However, the book of the past is there, written in the work done. What has it to tell us? In one way, not very much. Careful tabulation of the colours used at various epochs and in various countries does not lead to anything very definite. Fuller knowledge on the subject would, no doubt, help us to determine when and where a given piece of enamel was done; but it is precisely the date

and derivation of the pieces that would be most helpful in this matter, about which there is most doubt; and sometimes the enamel is in such a state of decay that we can only guess at what the colour was.

The colours universally employed in what we call barbaric enamel—British, Gaulish, Celtic, or whatever it may be—are first of all sealing-wax red, cobalt blue, dark green, yellow varying from orange and lemon to an ochreish tint, and white and black. There is also found a greenish powder too far gone in decay to identify, but suggestive of turquoise, a colour said to be characteristic of ancient Russian work. The colours in the Pinguente bottle (page 19) are blue, orange, and red. In the Roman altar (overleaf) they are blue, green, red, and pale green of the powdery description. The red is often in very bad condition also. The translucent colours in Irish work are puzzling, unless they are millefiori glass, which I am inclined to think they are.

Some slight progressive change may be traced in the palette of the Byzantine enamellers. They had from the first translucent sapphire blue and emerald green, much used for backgrounds, ruby red, manganese violet or purple, opaque sealing-wax or coral red, black, and white, which was used for flesh.

Towards the eleventh century light blue was introduced, either of an ashen tint (cobalt) or turquoise, lemon or Naples yellow, and a pinkish flesh tint sometimes inclining to yellow, the variation in which seems to have been a matter of accident.

In the twelfth century work, turquoise, green, and red are prominent; but it is probable that the tenth century enamellers had all these colours in their palette. Though evidently preferring in the main translucent colours, they used also opaque ones for want of them,

and produced very pretty effects of ornament in dead colours upon a lively translucent green ground.

The colours first used in Limoges appear to have been blue, green, and red. Already in the twelfth century we have also lighter tints or half-tones, together with

112. ROMAN CHAMPLEVÉ BRONZE ALTAR, FOUND IN BRITAIN, NOW IN THE BRITISH MUSEUM.

purple and iron grey. The full palette is made up of blue, from very deep to lapis and light blue; sealing-wax red, varying toward chocolate; green; yellow green; white; and manganese purple. This last is inclined to be semi-translucent. Mixed with white, it makes a granular and rather unpleasant purple grey, which occurs in a very pale tint as a flesh colour. A deep smalt ground is characteristic, and blue is altogether the predominant colour, especially in the thirteenth century. In the twelfth that also is sometimes slightly translucent. Afterwards the colours are consistently opaque.

The Rhenish and other German enamellers used much the same colours as those of Limoges, but they were not so faithful to the cobalt ground as the French. They made abundant use of turquoise, and were greatly given to the use of green and Naples yellow. Black also they employed.

The palette of the Chinese was practically the mediæval one; and they too made lavish use of lapis and turquoise blues. They had two opaque reds, the one sealing-wax colour, the other more like the potter's opaque variety of so-called "sang-de-bœuf." Their lemon yellow, green, and yellow green were those of the European enamellers. The mauve tint occurring in their work may be due to cobalt and a little manganese; but the rose-pink is, on the face of it, akin to that in porcelain of the "famille rose," that is to say, a gold colour. Black and white they have, of course; but their white is at the best not very pure, and in early work it is pitted with air-holes. Certain drab or muddy tints which occur in Chinese work may be set down to accident.

The Japanese worked in much the same colours as the Chinese; but the result was decidedly lower in tone,

owing partly to the predominance of a dark green, often used as a ground.

In Russian and Hungarian work in wire-enamel, on silver, both opaque and translucent enamels, never very clear, are used, often in combination ; and the sight of opaque yellow, green, blue, white, and black at once suggests the influence of these countries. The same colours occur, however, in German enamel on silver and in the seventeenth century English brass-work. A difference noted by Hampel between Russian and Hungarian colour is, that there was used in Hungary, but not in Russia, an opaque red, which after the sixteenth century died out, when yellow took its place.

One's impression, formed in the museums of Buda-Pesth and Vienna, is that in both countries the colour scheme inclines to be cold. Green, blue, and yellow seem to predominate. The nearest approach to red, that lives in one's memory, is manganese purple.

The only peculiarity in the colour of " Basse Taille " was that it was naturally confined to translucent colours, except where, in early days, they made sparing use of an opaque sealing-wax red, for want of anything like its equivalent in clear colour. After the discovery of the gold " purple of Cassius " they used that.

The Indian enamellers had in addition to the usual translucent colours, and some opaque ones, a very beautiful ruby, sometimes called Jaipur red, which, it seems, is really an iron yellow stained with copper. It is singularly beautiful in colour; and they rely at Delhi greatly upon this ruby colour, a copper emerald colour, and opaque white. In Kashmir they depend chiefly upon cobalt blue, copper green, and turquoise. In any case they restrict themselves, or are restricted, in the number of colours they employ. Apart from India, the enamel of Central Asia seems to have been opaque.

The pioneers in enamel painting, as distinct from goldsmith's enamelling, used, in addition to the clear blue, green, purple, and yellow of the Byzantine enamellers, an opaque red, which rises up above the other colours just as Rhodian red stands up above the transparent colours in Persian pottery. If it is not the same substance, it must be something very like it. It occurs also in fifteenth century enamel. For their flesh tints they used manganese purple and white. Later they used, besides translucent colours, turquoise, lemon, and other opaque tints upon white.

Every enameller, of course, wants to know what are the possibilities in the way of enamel colour, and we need not reckon it to him as a fault if he makes the most of his material. It would be against nature and against art not to revel in rich colour. But that is far from saying he should never stop short of the full possibilities afforded by his medium. Restraint is everywhere a quality. And it is to be noted that where, by exception, the artist has confined himself to a modest scheme, it not only arrests attention, but satisfies the taste of the "gourmet," as distinct from the "gourmand," in colour. Quiet combinations of black and white and gold give so little scope that they are justified rather by their significance than by their effect, and certain blue and white Chinese enamel is perhaps too suggestive of porcelain to satisfy a keen appetite for vitreous colour; but the work of Delhi and Kashmir, already referred to, is enough to show how rich and yet how reticent enamel may be; and I have memories of simple schemes—cobalt blues and olive greens upon white; cobalt, turquoise, cool green and black, on white; white, turquoise, and green upon cobalt—which are a joy for ever. One of the most beautiful pieces of

113. FRENCH OR ITALIAN ONYX VESSEL, JEWELLED & ENAMELLED, NOW IN THE KUNST HISTORISCHES MUSEUM AT VIENNA.

mediæval work I ever saw was in varied shades of blue and green upon white, and one of the most delicate pieces of late French work was in translucent green and yellow in association with white.

The great goldsmiths of the Renaissance were sometimes very sparing in their use of colour, subordinating it to the more precious jewels. There is something very artful in the way they will use chiefly white next natural stones, or in other ways keep colour and jewels apart, as, for example, where the links of a chain or bracelet are alternately jewelled and enamelled. In the beautiful onyx vessel opposite, the discreet reliance upon white strapwork and gold filigree on a black ground gives extraordinary value to the jewels caught in the meshes of the ornament.

It would be easy to multiply examples; but enough has been said to call attention to the possible advantage of a more sparing use of colour than we commonly indulge in. It seems to be thought that, because bright colour is to be got in enamel, the brighter the better, and the more of it the more beautiful. There is wisdom in the paradox that the half is more than the whole—sometimes.

XXVI. THE METAL AND THE PALETTE.

Enamellers seem in certain districts, or at certain periods, to have been restricted in their choice of colour, so much so that we sometimes associate a particular colour scheme with a particular school.

Their work profits, no doubt, by its reticence, if reticence it was. It is open to doubt, however, whether it was so much artistic conscience which held them in check as inability to go further. Working on a basis of bronze, for example, they had no option in the matter. Only opaque colours were within their range, though in the twelfth century they seem to have happened upon translucency in their manganese purple. Such choice as they had was guided by a desire to imitate natural stones; and their colour composition would inevitably be affected by the consideration of using together only such colours as could safely be fired at one heat; but the factor there was no controlling was, the metal on which the enamelling was done. On gold itself enamellers could not get all colours translucent—some of the oxides employed in colouring glass themselves destroy its translucency—and they were obliged to make shift with an opaque substitute which, like the red employed by fifteenth century Limoges painters (it looks as if it were actually the fine iron-stained earth known in Persian pottery as Rhodian red), never seemed quite at home in the midst of brilliantly translucent tints. Still they used translucent colours when they could; and we associate enamel on gold with

translucent colours, and opaque colour with bronze or brass, in the composition of which there was tin enough to dull it. Iron also compelled a narrow range of opaque colour.

Silver and gold not only allowed of brilliant colour, but enhanced its brilliancy by the way they shone through it. Translucent colour of a rather dull sort on copper was made brighter by means of an under-layer of opaque white enamel, the tin in which, not being in the form of metal, did not injuriously affect it. The use of some metals which might otherwise suggest themselves to the enameller is ruled out of account by the fact that their melting point is lower than that of enamel.

Opaque enamel, then, may be on any metal infusible enough to stand the heat of the enamel kiln.

Translucent colour is most perfectly developed on gold, which, by the way, stands the fire better than any other metal; but an alloy of gold and silver, or silver by itself, admits also of translucent colour. On copper the clear colours show to less advantage.

The Byzantine enamellers worked nearly always either on gold or on an alloy of gold and silver. The objection to pure silver is that its melting point is so little higher than that of some enamels that there is a certain amount of risk with it. That it loses something of its brilliancy in the fire does not so much matter. Translucent blue on gold shows slightly greenish. This is avoided by underlaying the blue with silver foil. Gold or silver foil may also be used to prevent the contact of the colour with anything in a baser metal which would tarnish it.

In practice enamellers seldom denied themselves the luxury of translucent colour when they could get it. When they could not, they had to content

themselves with opaque. It was not so much a matter of choice with them as of chemical possibility. They sometimes seem to get a certain degree of translucency (in copper green, for example, manganese purple, and cobalt blue), as it were by accident, in the midst of colours for the rest opaque.

Enamellers on silver did not as a rule confine themselves to translucent colour. They would use, for

114. CHINESE ENAMEL ON SILVER.

example, transparent blue, green, and turquoise in association with opaque lilac, lemon, and pale green. The Russians, who worked largely in silver, kept very much to cold colours, such as blue, green, turquoise, and pale yellow, having presumably no available red.

If any proof were necessary to show that the use of opaque colours was compulsory upon the Chinese, working as they did upon brassy bronze, it would be afforded by the fact that when they work in silver, as in some of their jewellery (114), they use colour as translucent as they can get it. It is always a little cloudy,

which may be due to impurities in the ore; the silver has often the heavy look of pewter. It is possible that the much lower tone of old Japanese enamel colour, as compared with Chinese, was less a question of taste (although as colourists the Japanese are not to be compared with the Chinese) than of the composition of their bronze, which made it more difficult to get bright colour. It is not likely that the Japanese would use precisely the same composition for their thin beaten vessels as the Chinese for their thick cast ones.

Enamel colours upon brass are usually crude as well as opaque, and they are the same harsh tints everywhere. Black, white, two shades of blue, chrome green, and a manganese purple brown not quite devoid of translucency, occur no matter where. In Albanian work we get sealing-wax red, orange, and chrome-like yellow, and in Russian, in addition to them, turquoise. English work was commonly confined to two colours and black or white. The exceptionally brilliant, semi-translucent green ground in some brass stirrups in the Wallace collection seems to have been got by laying it over a foundation of tin white.

Enamelled iron is not, as some may suppose, the invention of the modern advertiser. The Chinese employed it to more artistic purpose, and there are remains of Gallo-Roman work said to be as early as perhaps the third century; but it cannot be said to amount to anything worth artistic consideration.

INDEX.

PAGE

Air bubbles 121, 205
Albanian 213
Altar (Roman) .. 20, 21, 203
Altenstetter (David) .. 103
Angermaier (Christopher).. 103
Anglo-Saxon goldsmith's work 29, 30, 56, 78
Antimony 194, 195, 197
Appliqué embroidery .. 116, 117
Arabian ware 52
Armenia 54
Arsenic 198, 199
Asia (Central) 206
Assyria 54

Balkan Peninsula (The) .. 50
Barbarian enamel (Early).. 54
Barbaric work ..21, 56, 77, 203
Basse taille .. .. 101 *et seq.*, 5, 48, 100, 108, 151, 206
Battersea 186, 187, 188
Bibracte 17
Black ..195, 196, 197, 199, 202
Blended colours .. 140 *et seq.*
Blowpipe 4, 13
Blue 8, 197, 198
(*See also turquoise and cobalt.*)
Bock, Dr. F. 28, 116
Brass 100, 206, 211, 213
Brasses 79, 80
"Braun-email" 79
British 29, 56, 203
Bronze .. 20, 21, 40, 44, 46, 76, 77, 88, 149, 210, 211, 212, 213

PAGE

Bronze cloisons 44
Bronzeworker 67, 88
Bry (Theodor de) 103
Buda Pesth 29, 98, 206
Burgos cathedral 47
Burgundian cups 165
Bushell (Dr.) 96
Byzantine .. .. 28 *et seq.*, 21, 37, 40, 49, 78, 86, 91, 108, 116, 117, 140, 203, 207, 211
,, cloisonné..28 *et seq.*, 63 *et seq.*, 14, 27, 43, 45, 49, 62, 82, 84, 91, 92
,, goldsmith (The) 56, 61, 62, 70

Canton enamel 188, 190
Casting 98, 100
Caucasus 54
Celtic .. 16, 24, 26, 77, 78, 82, 149, 203
Cement 8, 10, 60, 62
Champlevé .. 42 *et seq.*, 67 *et seq.*, 20, 94, 95, 96, 109, 122, 124, 126, 190
,, and cloisonné 82 *et seq.*, 44, 45, 46, 67
,, jewellery .. 21
Champlevé on silver 40
Chartres 180, 184
Chasing .. 68, 73, 74, 78, 84, 95, 102, 136, 190
China (Introduction of enamel into) 50, 51, 52

PAGE

Chinese .. 52, 65, 89, 90, 95, 96, 98, 109, 112, 121, 126, 146, 188, 189, 190, 205, 207, 212, 213
,, cloisonné .. 51, 52, 77, 84, 86, 108, 121
Chosroes (The cup of) 56
Chromium 195, 197, 198
Classification 4
Cloisonné .. 61 *et seq.*, 13, 60, 82, 84, 95, 108, 110, 112, 122, 166
,, (Byzantine) 63 *et seq.*, 14, 27, 49, 91, 92
,, and Champlevé 44, 45, 46
,, design 84
,, enamel upon porcelain .. 66, 147, 148
,, jewellery .. 55 *et seq.*, 8, 67, 82
Cloisons 44, 46, 61, 63, 64, 67, 86, 91, 92, 96, 112, 166
,, (avoidance of) .. 66
Cobalt .. 194, 195, 197, 198, 199, 212
Cologne 38
Colour .. 193 *et seq.*, 201 *et seq.*, 58, 192
Conques 96
Copper .. 195, 197, 198, 199, 211
,, cloisons 46, 67
Coppersmith 67, 84
Copper wire 46
Coral (Imitation of) .. 16, 56
Court (Susanne) 154, 158
Courteys (The) 158, 172
,, (Jean) 154, 160
,, (Pierre) .. 160, 180
Crown (The Iron) 28

PAGE

Crown of Charlemagne .. 91
,, of Constantia 36
,, of Constantine Monomachus 36, 91
,, of Rudolf II. 150
,, of S. Stephen 29, 98, 131
,, from Guarrazar .. 56
Crystal (Inlay on) .. 56, 58
Cunynghame (H. H.) .. 184, 193
Cup (The Augsburg) 103
,, of Chosroes 56, 132
,, of the Kings of France and England 106

Decomposition 20
Delhi 60, 206, 207
Demetrius Tafel 93, 94, 135
Design and process 84
,, for cloisonné 84
Detail 64, 65
"Devil's ware" 52
Digging out 23
Dresden 186

Early enamels 2, 54
Eastern enamel .. 50 *et seq.*, 118, 120
,, origin of enamel .. 30, 31, 52, 54
Egypt 54
Egyptian .. 7, 8, 62, 67, 82, 146, 150
,, glassworking .. 10
Eighth century 27, 28
Eighteenth century .. 101, 107, 126, 136, 186, 190
Eleventh century .. 23, 28, 29, 96, 140, 203
Enamel (what it is) .. 1, 193
,, and glass .. 55, 56, 58
,, and goldsmith's work 32, 34

PAGE

ENAMEL AND PRECIOUS STONES 58
,, COLOUR .. 1, 3, 55, 58, 207
,, PASTE 23, 24
,, PLAQUES ON STUFF 35
,, UPON MOTHER-OF-PEARL 148
ENCAUSTIC 79
ENCLOISONED glass and stones 55 *et seq.*, 18, 32
ENGLAND 40
ENGLISH .. ..ICO, 144, 206, 213
ENGRAVING 68, 74, 75, 84, 101, 103
"EN RÉSILLE" .. 147 *et seq.*
ETCHING 81
ETRUSCAN 14, 61

FIFTH CENTURY 21, 32
FIFTEENTH CENTURY .. 63, 104, 129, 136, 153, 165, 166, 207, 210
FIGURE design (Mediæval) .. 70
FIGURES in relief 72
FILIGREE 14, 60, 112, 113, 117, 119, 129, 209
,, ENAMEL 49, 117
FINIFT 50
FINISH 121
FIRE-POLISHED 96, 109
FIRING 4, 196
FLEMISH 148
FLESH 72, 156, 157, 158, 167, 183, 184, 185, 203, 205, 207
FOIL 154, 166
FOURTH century 13, 21
FOURTEENTH century .. 52, 104, 106, 135
FRANCE 38, 40
FRANKISH 21
FRENCH .. 96, 101, 103, 107, 144, 148, 187, 188, 205, 209
,, CHAMPLEVÉ 76

PAGE

FRETTED work 96, 118, 119, 149
FURNACE 4
FUSIBILITY 4
FUSION 61, 62, 193

GALLO-RHENISH 146
GALLO-ROMAN .. 21, 22, 46, 144, 213
GAULISH 16, 21, 203
GEOMETRIC design 22, 23
GERMAN .. 49, 50, 72, 79, 98, 103, 108, 118, 140, 166, 186, 205, 206
,, CHAMPLEVÉ .. 45, 76
GERMANY 37, 38
GILDING 76, 77, 79
GLASS 2, 17, 25, 27, 55, 193, 194
,, AND ENAMEL .. 2, 24, 26, 55, 56, 58
,, INLAY .. 10, 21, 23, 58, 59
,, ,, ON POTTERY .. 10 146
,, ,, ON SOAPSTONE 10
,, MOSAIC 22
GLASS-BLOWER and jeweller 14
GLASSWORKER and enameller 17, 18, 20
,, and metal-worker 18, 19
GLAZING with translucent colour 178
GOLD 44, 47, 86, 150, 156, 164, 172, 195, 210
,, cloisons .. 44, 46, 67
GOLD foil 154, 166, 211
,, paint 154, 156, 166
,, ruby 196
GOLDSMITH 3, 27, 61, 82, 89, 135
,, AND BRONZE WORKER .. 43, 44, 46, 86, 88

PAGE

Gothic enamel .. ..37 *et seq.*, 82, 140
Gratz 103
Gradation of colour .. 103, 104, 106, 143
Græco-Roman 26
Græco-Russian 49
Greek .. 8, 14, 15, 25, 82, 114
Greeks (The).. .. .. 61, 134
Green 195, 197, 198, 202
Grey.. 195
Grisaille .. 167 *et seq.*, 5, 164
Grisaille (Tinted) .. 177 *et seq.*
Grounding out .. 67, 74, 81, 82, 102
Guarrazar (The crown from) 56

Hamilton brooch 30
Hampel, Dr. 120
Heads in relief 74
Hildesheim 37
Hirtu (Jacques) 78
Hispano-Flemish.. 101
Hungarian .. 49, 112, 113, 116, 117, 118, 119, 120, 124, 136, 166, 188, 201, 206
Huy 38
Hyderabad 94

Imitation .. 55, 56, 148, 190, 201, 202, 210
,, cloisonné 42
Incrustation 56, 135, 159, 161
Incrusted enamel .. 133 *et seq.*
Indian .. 52, 78, 95, 97, 98, 101, 102, 119, 148, 206
Indo-China 12
Inlay .. 8, 10, 21, 23, 46, 56, 80, 150
Inlaid enamel 67
Inscriptions in gold wire .. 65
Iridium 195, 196, 197, 202
Irish.. .. .. 25, 203

PAGE

Iron .. 194, 195, 197, 198, 199, 211, 213
,, crown 28
Italian 40, 79, 174
Italy 40, 48, 104

Jade (Inlay on) 56, 58
Jaipur .. 60, 78, 102, 124, 197, 206
Janssen 187
Japan 52
Japanese.. .. 66, 89, 139, 146, 205, 213
,, cloisonné .. 84, 110, 147
,, patternwork .. 65
Jewellery 8, 21, 25, 26
,, and textiles .. 36
John of Pisa 104

"Kalt-email" 81
Kashmir 94, 95, 206, 207
Kiln.. .. .. 17, 196
Klosterneuburg 142
Kondakow, N.. 12, 28, 31, 50, 64, 92, 134, 146

Lahore 52
La Téne period 18
Launе (Etienne de) 149
Lavender 199
Lead 194, 195, 197
Lemans 140
Leonard Limousin .. 5, 156, 170, 172, 174, 177, 180, 182, 184, 185
Lilac 198
Limoges .. 23, 38, 40, 42, 47, 48, 74, 104, 114, 143, 146, 151, 168, 204, 210
Liverpool 186
Lombardic 28
Lucknow 78, 102, 119

PAGE

LUTHMER (Ferdinand) .. 79, 116, 171
LYTE jewel (The) .. 60, 78, 136

MADRID 56
MAESTRICHT 38
MAKESHIFT (Enamel regarded as a) 58, 59, 60
MANGANESE .. 157, 158, 194, 195, 196, 197, 198, 199, 212
MASTICS 60, 80, 81
MAUVE 199
MEDIÆVAL enamel .. 37 *et seq.*, 70, 72, 84, 95, 108, 153, 205, 209
MEROVINGIAN 22, 56
METAL, The (and the palette) 210 *et seq.*
„ as a foil to colour .. 86
MILAN (S. Ambrogio) 29
"MILLEFIORE" glass .. 23, 24, 26, 27, 203
MINIATURISTS (The) 187
MOGUL work 56, 58, 148
MONTE Cassino 28, 40
MONTPELIER 104
MONUMENT of Archbishop Maurice 47
MONZA 28
MOSAIC (Glass) 22
MOUNT Athos 50
„ Beuvray 17
MULTAN 98
MUSEUMS:—
BERLIN (Gewerbs Museum) 118
BUDA PESTH (National Museum) 36, 91
COLOGNE (Gewerbs Museum) .. 63, 79, 164
DUBLIN 26
FLORENCE (Bargello) .. 36, 107

PAGE

MUSEUMS (*contd.*):—
LONDON (British Museum) .. 8, 10, 13, 14, 16, 106, 118, 126, 142, 158, 164, 189
„ (Victoria and Albert Museum) .. 21, 24, 26, 36, 78, 129, 142, 166
„ (Wallace Collection) .. 187, 213
MUNICH (National Museum) 100
NUREMBERG (Germanic Museum) .. 36, 98, 146
PARIS (Bibliothèque Nationale) 22, 36, 56, 132
„ (Cluny) 21, 36, 154, 160
„ (Louvre) .. 10, 36, 92, 101, 136, 139, 160, 180
„ (Musée des Arts Décoratifs) 107, 150
„ (Petit Palais) .. 67
ROUEN 24
S. GERMAIN 17, 18
S. PETERSBURG (The Hermitage) 52
VIENNA (Gewerbs Museum) .. 43, 92, 93, 140
„ (Kunst Historisches Museum) 16, 21, 81
„ (Imperial Treasury) .. 29, 35, 92, 116, 150
MYCENEAN Period 14

NEAPOLITAN goldsmith's onlay 109
NIELLO 78, 79

PAGE

NINTH century 28
NOUAILHER (COULY) .. 153, 156

OLD-GOLD colour 153, 199
ON-enamel painting ..185 *et seq.*
OPAQUE colours .. 196, 197, 203, 205, 206, 210 *et seq.*
„ enamel .. 21, 36, 123
"OPUS Ragusanum" 49
ORANGE 195
ORIENTAL 94
"ORIENTAL-EUROPEAN" .. 50
ORIENTAL influence 56
ORIGIN of enamel 2, 3, 16, 30, 31, 54

"PAILLONS" 154
PAINTED cloisonné .. ..122 *et seq.*
„ enamel .. .. 122, 126, 151 *et seq.*
PAINTING (on enamel) ..185 *et seq.*
„ (Pâte-sur-pâte) .. 157, 167, 168, 170, 186
„ in Grisaille .. .. 164, 167 *et seq.*
„ in translucent colours.. .. 151 *et seq.*, 177
PALA d'Oro (The) .. 29, 36, 65, 92
PALETTE (changes in the) .. 201 *et seq.*
„ of the enameller 193 *et seq.*
Palliotto at Milan 29
PARIS 38, 40, 186
PASTE 3, 23, 24, 193
PÂTE-SUR-PÂTE painting .. 157, 167, 168, 170, 186
PENICAUD (Jean I.) ..152, 153, 156, 177
„ (Jean II.) 156, 171, 178, 180
„ (J. III) 176, 184
„ (J. B.) 153

PAGE

PENICAUD (NARDON) .. 5, 152, 153, 154, 156, 157
PENCILLING 123
PERFORATED porcelain.. .. 131
PERM (The find at) 52
PERSIAN .. 32, 52, 54, 78, 124, 164, 165, 190, 191, 201
„ origin of enamel .. 31, 32, 52
PETITOT 5, 187
PETROSSA (The find at) .. 56
PEWTER 213
PHINIPT 50
PHŒNICIANS 54
"PICKING out" 156
PICTORIAL work .. 106, 107, 174
PINGUENTE flask .. 20, 21, 203
PINK 184, 197
PISA (John of) 104
PITTED 121
PLANTAGENET panel 140
PLAQUES of painted enamel.. 158
„ (Small Byzantine) 32, 33 *et seq.*
„ (Small Gothic) .. 47
PLIQUE à jour.. .. ..129 *et seq.*
POLISH 108, 109, 110, 121
POPELIN (Claudius) 176
PORCELAIN .. 186 *et seq.*, 207
PRECIOUS stones 2, 55, 56, 201, 202
PUNCHED ground 118
PURPLE .. 194, 197, 199, 202, 212
„ of Cassius .. 197, 198

RAGUSA 49
RAJPUTANA 97
RED enamel (Early) .. 20, 21
RED .. 20, 21, 153, 164, 184, 195, 197
REDDISH colour in old work 12
RELIEF 72, 74, 106

PAGE

Reliquary of Pepin of Aquitaine 96
Renaissance 61, 136
,, goldsmith's work 78, 202, 209
Repoussé .. 85. 91 *et seq.*, 122
"Reserved" .. 68, 70, 72
Reymond (Pierre) .. 171, 172, 177, 180, 184
Rhenish .. 23, 40, 76, 142, 143, 205
Roman 21, 203
,, glass mosaic .. 22, 23
Romano-British .. 21, 26, 144
Ruby 154, 195, 196, 197
Russia 54
Russian 50, 100, 112, 113, 116, 119, 120, 123, 131, 203, 206, 212, 213

St. Bernwald 37
S. Denis 38
S. Micklos treasure 16
Scandinavian work 131
Scraping out 168, 171, 172
Scratching out lines 144
Selenium 195, 196, 197, 202
Seventh century 27, 32
Seventeenth century .. 52, 100, 102, 108, 119, 123, 124, 126, 186, 187, 188, 202, 206
Sgraffito 144, 156
Shading 104, 124, 142, 165
Shield found in the Thames 16
,, of Charles IX... .. 160
Sicilian 28, 29, 36, 92, 114
Silver .. 21, 40, 48, 195, 197, 198, 199, 211, 212, 213
Silver foil 154, 211
Sixth century.. .. .. 28, 32
Sixteenth century .. 103, 108, 118, 124, 135, 166, 167, 177, 180, 206

PAGE

Slavonic work 50, 54
Society of Antiquaries .. 146
Soda.. .. .. .. 195, 197, 198
Soldering 61, 62, 66
Spanish 63, 108, 202
Stained glass and enamel .. 42, 43
Stamping 98
"Still" colour 5
Suger (Abbot) 38
Sweden 54

Tapes of metal .. 62, 68, 108
Technique (Rediscovery of) 15
Tegernsee 38
Tenth century B.C. .. 14, 15
,, ,, A.D. 29
Theodor de Bry 103
Theophano 37, 38
Thibet 189
Thibetan 121
Third century 20
Thirteenth century .. 23, 36, 40, 47, 74, 76, 79, 140, 205
Tin .. 194, 196, 197, 198, 199, 211
,, enamel .. 168, 172, 190
Tinted grisaille .. 177 *et seq.*
Tomb of William de Valence 40
Toutin (Jean) 187
Translucent and opaque .. 36, 101, 124
,, champleve .. 101, 102, 104
,, colour, 101 *et seq.*, 122, 123, 196, 197, 205, 206, 210 *et seq.*
,, colour on silver .. 48
,, enamel.. 36, 129 153
,, incrustation 161
,, pattern-work 25

PAGE

Trèves 37, 38
Troyes 142
Turanian origin of enamel 31, 52
Turkey 50
Turkish work 119
Turquoise (Imitation of) .. 56
Turquoise blue 195, 197
Twelfth century.. 38, 43, 72, 79, 140, 142, 146, 203, 204, 205, 210

Unpolished 110, 118, 121
Uranium 195, 196, 197, 202

Venetian enamel .. 79, 118, 136, 161 *et seq.*
Venice 40, 49
,, (S. Mark's) 29, 65, 92

PAGE

Venice (S. Mark's Treasury) 32
Verdun 38
,, altar 142
Vienna 148, 165, 206
Von Falke, Dr. O. 44

Wax "enamel" 60
Westminster Abbey .. 40, 42
Westphalian 76
White 123, 124, 136, 153, 169, 170, 172, 197
Wire 112, 113, 114, 116
,, enamel .. ..113 *et seq.*, 50, 166, 206

Yellow 195, 196, 197, 198, 199, 202

Zinc 194

THE END.

BRADBURY, AGNEW, & CO. LD., PRINTERS, LONDON AND TONBRIDGE.

A000030

3 5134 00128558 0

NK 5000 .D35
Day, Lewis Foreman, 1845-
1910.
Enamelling

29My33

DEMCO